SLR-EP – 125

Seat No.	

Set P

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) $\frac{x^2}{2}e^{-x}$ d) ∞

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

a) $e^x x^2$ 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 $\int_0^t \text{Sin}2u\,du$ is

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

P.T.O.

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

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

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

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

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) $\phi\left(x^2, y^2\right) = 0$

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 $\bar{a} = \frac{\bar{r}}{3}$ then $\text{div}(\bar{a})$ =

a) 0 b) 1 c) –1 d) 2

10) Which of the following is not true ?

a) $\nabla\phi$ is a vector quantity
b) $\nabla.\bar{v}$ is a scalar quantity
c) $\nabla \times \bar{v}$ is a scalar quantity
d) $\nabla.\nabla\phi = \nabla^2\phi$

11) If $\bar{r} = xi + yj + zk$, then $\nabla \times \bar{r}$ =

a) 3 b) $\frac{1}{3}$ c) 0 d) –3

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

a) $|z| > 1$ b) $|z| < 1$ c) $z < 1$ d) $z = 0$

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

a) $\sqrt{\frac{2}{\pi}}\int_0^\infty f(x).\cos sx\,dx$
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) $\sqrt{\frac{\pi}{2}}\int_0^\infty f(x)\cos sx\,dx$

SLR-EP – 125

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.

Instructions : *1) Attempt **any three** questions from **each** Section.*
*2) Figures to **right** indicate **full** marks.*
*3) **Use** of calculator is **allowed**.*

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 interms of Heaviside unit step function and hence find their Laplace transform.

   $$f(t) = \begin{cases} \cos t, & 0 < t \le \pi \\ 1, & \pi < t \le 2\pi \\ \sin t, & t > 2\pi \end{cases}.$$ **3**

   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 $\text{Cot}^{-1}\left(\frac{s+a}{b}\right)$. **3**

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

   OR

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

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 $\nabla\left(\bar{a}.\nabla\frac{1}{r}\right) = \frac{-\bar{a}}{r^3} + \frac{3(\bar{a}.\bar{r})\bar{r}}{r^5}$ where $\bar{a}$ is a constant vector and r, $\bar{r}$ 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 $z\{k2^k + k3^k\}$, $k \geq 0$.

8. a) Find Fourier series of $f(x) = x\sin x$ in $(-\pi, \pi)$. Hence deduce that **5**

   $$\frac{\pi-2}{4} = \frac{1}{1\times3} - \frac{1}{3\times5} + \frac{1}{5\times7} - \ldots$$

   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 $(0, \pi)$. **4**

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   c) Find f(x) if its Fourier cosine transform is e^{-s}. **3**

Set P

SLR-EP – 125

Seat No.	

Set Q

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.

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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 $\bar{a} = \frac{\bar{r}}{3}$ then $\text{div}(\bar{a}) =$
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P.T.O.

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SLR-EP – 125

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.

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SECTION – I

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Set Q

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SECTION – II

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Set Q

SLR-EP – 125

Seat No.	

Set R

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.

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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P.T.O.

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SLR-EP – 125

Seat No.	

S.E. (Part – I) (E&TC) (CGPA) Examination, 2016
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Day and Date : Tuesday, 13-12-2016 Marks : 56

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SECTION – I

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Set R

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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 $\nabla\left(\bar{a}.\nabla\frac{1}{r}\right) = \frac{-\bar{a}}{r^3} + \frac{3(\bar{a}.\bar{r})\bar{r}}{r^5}$ where $\bar{a}$ is a constant vector and r, $\bar{r}$ 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 $z\{k2^k + k3^k\}$, $k \geq 0$.

8. a) Find Fourier series of $f(x) = x\sin x$ in $(-\pi, \pi)$. Hence deduce that **5**

   $$\frac{\pi-2}{4} = \frac{1}{1\times3} - \frac{1}{3\times5} + \frac{1}{5\times7} - \ldots$$

   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 $(0, \pi)$. **4**

9. a) Find the Fourier transform of $f(x) = e^{-a|x|}$. **3**

   b) Express the function $f(x) = \begin{cases} \sin x, & 0 \leq x \leq \pi \\ 0, & x > \pi \end{cases}$ as Fourier sine integral and hence evaluate $\int_0^\infty \frac{\sin\omega x \sin\pi\omega}{1-\omega^2}\,d\omega$. **3**

   c) Find f(x) if its Fourier cosine transform is e^{-s}. **3**

Set R

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Seat No.	

Set S

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) Which of the following is not true ?

a) $\nabla\phi$ is a vector quantity b) $\nabla.\bar{v}$ is a scalar quantity

c) $\nabla \times \bar{v}$ is a scalar quantity d) $\nabla.\nabla\phi = \nabla^2\phi$

2) If $\bar{r} = xi + yj + zk$, then $\nabla \times \bar{r} =$

a) 3 b) $\frac{1}{3}$ c) 0 d) –3

3) 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) $F\left(\frac{z}{a}\right)$

4) The region of convergence of z-transform of the sequence $f(k) = \begin{cases} 1, & k \geq 0 \\ 0, & k < 0 \end{cases}$ is

a) $|z| > 1$ b) $|z| < 1$ c) $z < 1$ d) $z = 0$

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

a) $\sqrt{\frac{2}{\pi}}\int_0^\infty f(x).\cos sx\,dx$ 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) $\frac{x^2}{2}e^{-x}$ d) ∞

P.T.O.

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

a) $e^x x^2$ 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) $\frac{1}{1-e^{-ST}}\int_0^T e^{-st}f(t)dt$ 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

9) The Laplace transform of $\int_0^t Sin2udu$ is

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

10) $L^{-1}\left\{\frac{S}{4S^2+9}\right\}$ 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) $\frac{1}{4}Cos\left(\frac{9t}{4}\right)$

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

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

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) $\phi\left(x^2, y^2\right)=0$

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 $\bar{a}=\frac{\bar{r}}{3}$ then $div(\bar{a})$ =

a) 0 b) 1 c) –1 d) 2

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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.

Instructions : *1) Attempt **any three** questions from **each** Section.*
*2) Figures to **right** indicate **full** marks.*
*3) **Use** of calculator is **allowed**.*

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 interms of Heaviside unit step function and hence find their Laplace transform.

   $$f(t) = \begin{cases} \cos t, & 0 < t \le \pi \\ 1, & \pi < t \le 2\pi \\ \sin t, & t > 2\pi \end{cases}.$$ **3**

   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 $\text{Cot}^{-1}\left(\frac{s+a}{b}\right)$. **3**

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

   OR

   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 $\nabla\left(\bar{a}.\nabla\frac{1}{r}\right) = \frac{-\bar{a}}{r^3} + \frac{3(\bar{a}.\bar{r})\bar{r}}{r^5}$ where $\bar{a}$ is a constant vector and r, $\bar{r}$ 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 $z\{k2^k + k3^k\}$, $k \geq 0$.

8. a) Find Fourier series of $f(x) = x\sin x$ in $(-\pi, \pi)$. Hence deduce that **5**

   $$\frac{\pi-2}{4} = \frac{1}{1\times3} - \frac{1}{3\times5} + \frac{1}{5\times7} - \ldots$$

   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 $(0, \pi)$. **4**

9. a) Find the Fourier transform of $f(x) = e^{-a|x|}$. **3**

   b) Express the function $f(x) = \begin{cases} \sin x, & 0 \leq x \leq \pi \\ 0, & x > \pi \end{cases}$ as Fourier sine integral and hence evaluate $\int_0^\infty \frac{\sin\omega x \sin\pi\omega}{1-\omega^2}\,d\omega$. **3**

   c) Find f(x) if its Fourier cosine transform is e^{-s}. **3**

Set S

SLR-EP – 126

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** 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) 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 Ic d) None

6) In voltage regulator using zener, the output voltage depends on
   a) Vin b) Vz c) RL d) All of these

7) Common base configuration in BJT provides
   a) Unity current gain b) Unity voltage gain
   c) Both (a) and (b) d) None of these

8) 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

9) Ripple voltage increases in shunt capacitor filter with
   a) Decreasing load current b) Increasing load current
   c) Zero load current d) None of these

10) Increase in load current for series inductor filter
   a) Decrease ripple b) Increase ripple
   c) Does not change the ripple d) None of these

11) 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

12) 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

13) The forward resistance of an ideal rectifier diode should be
   a) Infinity b) Negative c) Zero d) None of these

14) The reverse saturation current with increasing reverse bias
   a) Increases b) Decreases
   c) Remains constant d) Zero

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SLR-EP – 126

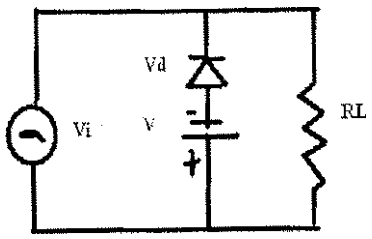
Seat No.	

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, Vd = 0, V = 3V.



3. Attempt **any two** : **(7×2=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 α and β.
   c) Derive expression Avs, Ais, Ri, Ro for transistor amplifier using voltage divider bias with emitter bypass capacitor.

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Seat No.	

Set Q

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

P.T.O.

5) 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

6) The forward resistance of an ideal rectifier diode should be
   a) Infinity b) Negative c) Zero d) None of these

7) The reverse saturation current with increasing reverse bias
   a) Increases b) Decreases
   c) Remains constant d) Zero

8) 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

9) The h-parameter of BJT are called
   a) Large signal parameters b) Small signal parameters
   c) T-parameters d) z-parameters

10) 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

11) JFET can be used as an _____ ohmic region.
   a) Oscillator b) Clock generator
   c) Flip-flop d) Resistor

12) Power dissipated in transistor amplifier depends on
   a) Vcc b) Re c) Vce and Ic d) None

13) In voltage regulator using zener, the output voltage depends on
   a) Vin b) Vz c) RL d) All of these

14) Common base configuration in BJT provides
   a) Unity current gain b) Unity voltage gain
   c) Both (a) and (b) d) None of these

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SLR-EP – 126

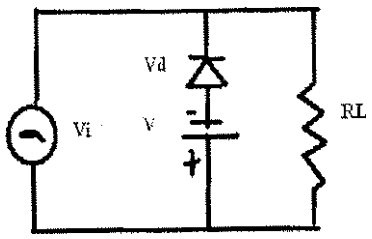
Seat No.	

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, Vd = 0, V = 3V.



3. Attempt **any two** : **(7×2=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 α and β.
   c) Derive expression Avs, Ais, Ri, Ro for transistor amplifier using voltage divider bias with emitter bypass capacitor.

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SLR-EP – 126

Seat No.	

Set **R**

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) Power dissipated in transistor amplifier depends on
   a) Vcc b) Re c) Vce and Ic d) None

2) In voltage regulator using zener, the output voltage depends on
   a) Vin b) Vz c) RL d) All of these

3) Common base configuration in BJT provides
   a) Unity current gain b) Unity voltage gain
   c) Both (a) and (b) d) None of these

4) In any circuit Zener diode is
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5) Ripple voltage increases in shunt capacitor filter with
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6) Increase in load current for series inductor filter
   a) Decrease ripple b) Increase ripple
   c) Does not change the ripple d) None of these

7) 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

8) 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

9) The forward resistance of an ideal rectifier diode should be
   a) Infinity b) Negative c) Zero d) None of these

10) The reverse saturation current with increasing reverse bias
   a) Increases b) Decreases
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11) Improper location of Q point leads to _____ of transistor amplifier.
   a) Distortion in input b) Distortion in output
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12) The h-parameter of BJT are called
   a) Large signal parameters b) Small signal parameters
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13) 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

14) JFET can be used as an _____ ohmic region.
   a) Oscillator b) Clock generator
   c) Flip-flop d) Resistor

_____

SLR-EP – 126

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.
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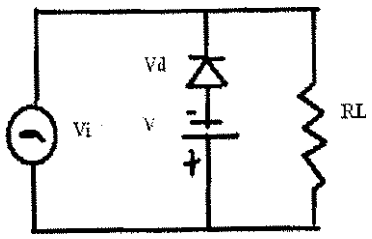

3. Attempt **any two** : **(7×2=14)**
   a) Explain types of shunt clipper circuits and shunt clampers with transfer characteristics.
   b) Draw circuit diagram of full wave rectifier with C filter and explain it's working. Derive expression of ripple factor of C filter.
   c) Design voltage source using 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.
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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 α and β.
   c) Derive expression Avs, Ais, Ri, Ro for transistor amplifier using voltage divider bias with emitter bypass capacitor.

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SLR-EP – 126

Seat No.	

Set S

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) Increase in load current for series inductor filter
   a) Decrease ripple b) Increase ripple
   c) Does not change the ripple d) None of these

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
   c) Remains constant d) Zero

P.T.O.

6) 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

7) The h-parameter of BJT are called
   a) Large signal parameters b) Small signal parameters
   c) T-parameters d) z-parameters

8) 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

9) JFET can be used as an _____ ohmic region.
   a) Oscillator b) Clock generator
   c) Flip-flop d) Resistor

10) Power dissipated in transistor amplifier depends on
   a) Vcc b) Re c) Vce and Ic d) None

11) In voltage regulator using zener, the output voltage depends on
   a) Vin b) Vz c) RL d) All of these

12) Common base configuration in BJT provides
   a) Unity current gain b) Unity voltage gain
   c) Both (a) and (b) d) None of these

13) 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

14) Ripple voltage increases in shunt capacitor filter with
   a) Decreasing load current b) Increasing load current
   c) Zero load current d) None of these

_____

SLR-EP – 126

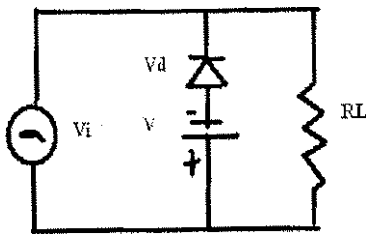
Seat No.	

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, Vd = 0, V = 3V.



3. Attempt **any two** : **(7×2=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 α and β.
   c) Derive expression Avs, Ais, Ri, Ro for transistor amplifier using voltage divider bias with emitter bypass capacitor.

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SLR-EP – 127

Seat No.	

Set **P**

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.***

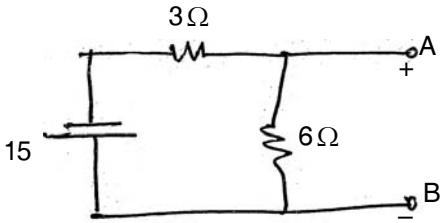
MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer : **(1×14=14)**

1) 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

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



a) 5A, 3 Ω b) 5A, 2 Ω c) –5A, 6 Ω d) –5A, 2 Ω

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 × 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

P.T.O.

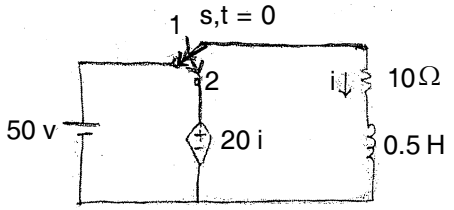
8) The transfer impedance is defined as
   a) The ratio of transform voltage to transform current at the same port
   b) The ratio of transform voltage at one port to transform current at the other port
   c) Both a & b
   d) None of the above

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 Ω resistance when the switch is changed from 1 to 2 is



   a) $5e^{20t}$ b) $5e^{-20t}$ c) $20e^{5t}$ d) $20e^{-5t}$

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) $\text{Cos}(Y)=1+Z_1/2Z_2$ b) $\text{Cosh}(Y) = 1+Z_1/2Z_2$
   c) $\text{Cosh}(Y) = 1+Z_1/4Z_2$ d) $\text{Cosh}(Y)=1+Z_1/Z_2$

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

SLR-EP – 127

Seat No.	

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

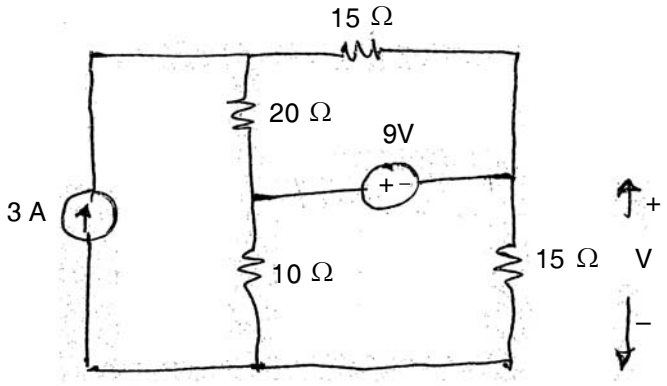
Day and Date : Saturday, 17-12-2016 Marks :56

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

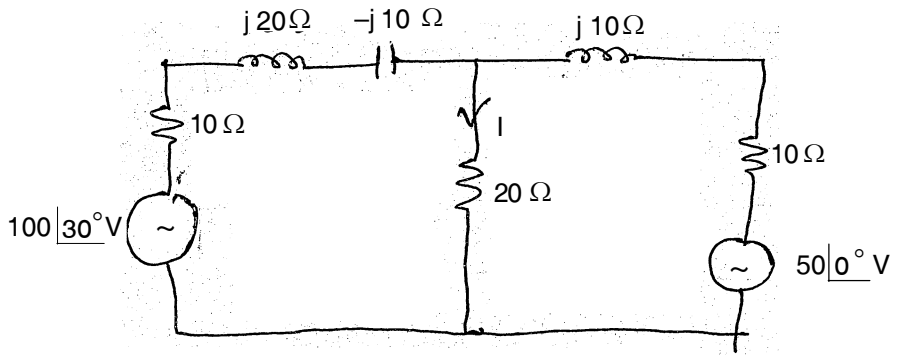
SECTION – I

2. Answer **any four** of the following. **(4×4 =16)**

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

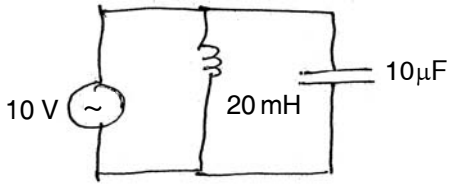


2) Draw the Norton's equivalent circuit for the network shown and hence find the current I

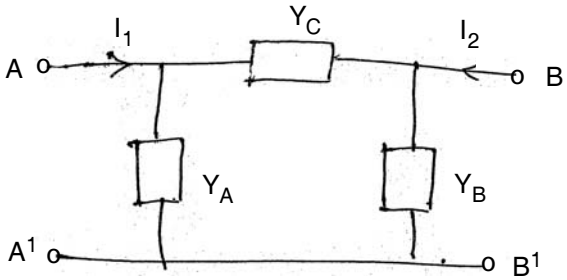


Set P

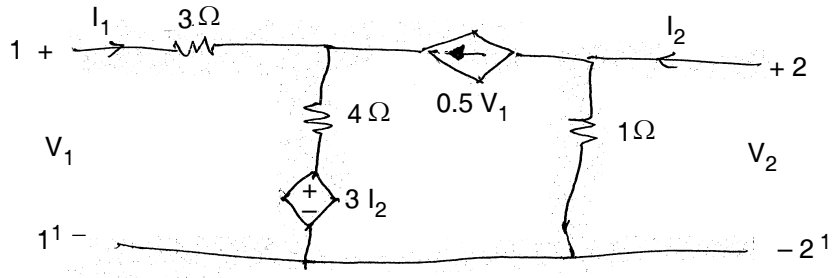
3) Derive an expression for resonant frequency for Parallel RLC circuit and hence find the resonant frequency for the circuit shown below.



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

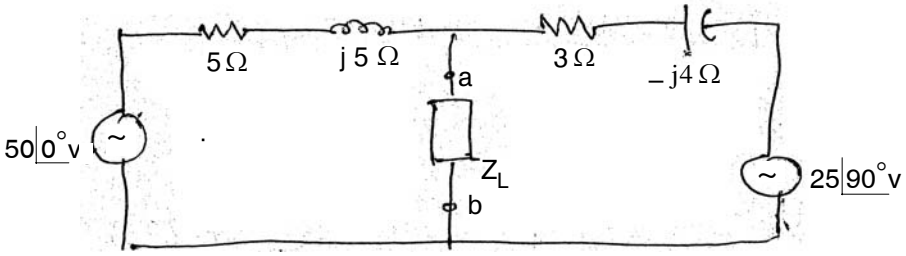


5) Determine h-parameters of the network.



3. Answer **any two** of the following. **(2×6 =12)**

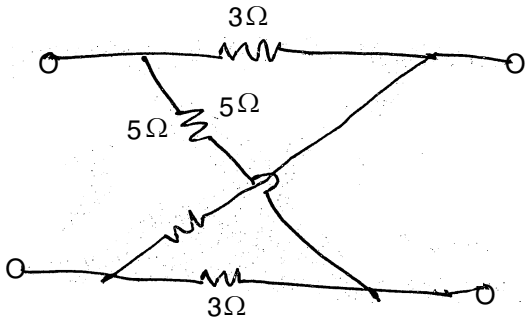
1) In the network shown two voltage sources act on a load impedance connected to the terminal a &b. If this load is variable in both reactance and resistance, what load ZL will receive the maximum power ? What is the value of Maximum Power ?



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 Ω , L= 0.1H & C = 10 μ F connected in series.

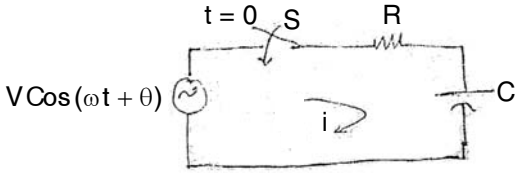
3) Determine the Z and h-parameters for the lattice network shown below.



SECTION – II

4. Solve **any four** : **(4x4=16)**

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

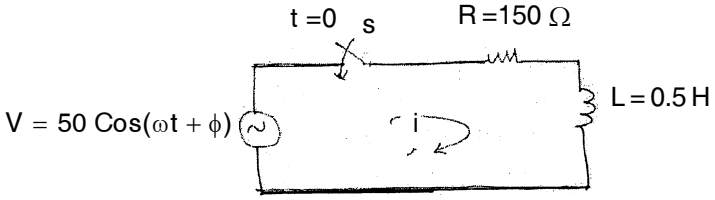


2) What is an attenuator ? State the necessity of it. Explain Lattice attenuator in detail.

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 Ω 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 + ϕ) is applied to the circuit at t = 0. Where ϕ =30°

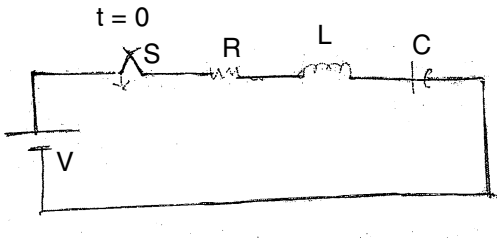


5. Solve **any two** : **(2×6=12)**

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

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 Ω, 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 Ω impedance.

SLR-EP – 127

Seat No.	

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 : **(1×14=14)**

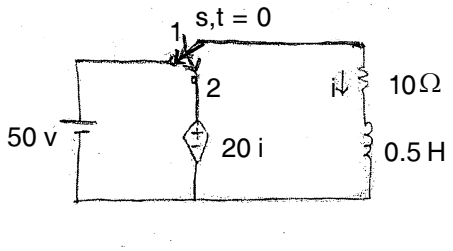
1) The transfer impedance is defined as
   a) The ratio of transform voltage to transform current at the same port
   b) The ratio of transform voltage at one port to transform current at the other port
   c) Both a & b
   d) None of the above

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) $\frac{V}{R}$ b) infinite c) zero d) $\frac{V}{L}$

4) For the circuit shown current in the 10 Ω resistance when the switch is changed from 1 to 2 is



   a) $5e^{20t}$ b) $5e^{-20t}$ c) $20e^{5t}$ d) $20e^{-5t}$

P.T.O.

5) The transient current in loss free LC circuit when excited from AC source is an _____ sine wave.
   a) un damped b) over damped
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6) 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) $Cosh(Y)=1+Z_1/Z_2$

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8) 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

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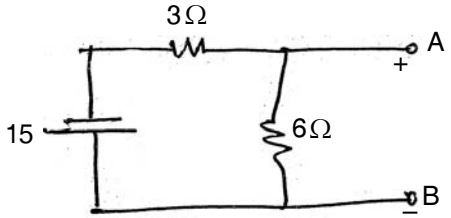


   a) 5A, 3 Ω b) 5A, 2 Ω c) –5A, 6 Ω d) –5A, 2 Ω

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 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

12) For a given value of Q and Resonant frequency fr, bandwidth is given by
   a) fr/Q b) Fr × Q
   c) Q/ fr d) None of the above

13) Which parameters are widely used in transmission line theory ?
   a) Z b) Y c) h d) ABCD

14) 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

_____

SLR-EP – 127

Seat No.	

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

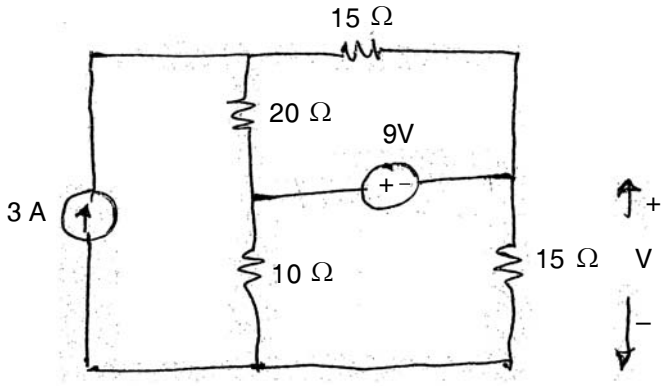
Day and Date : Saturday, 17-12-2016 Marks :56

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

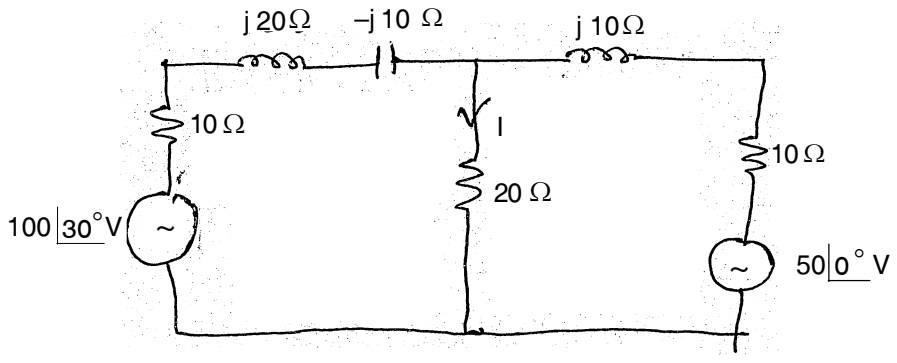
SECTION – I

2. Answer **any four** of the following. **(4×4 =16)**

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

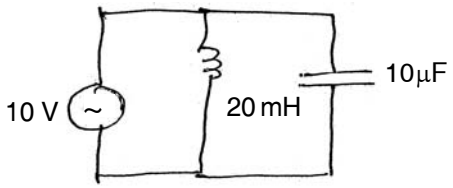


2) Draw the Norton's equivalent circuit for the network shown and hence find the current I

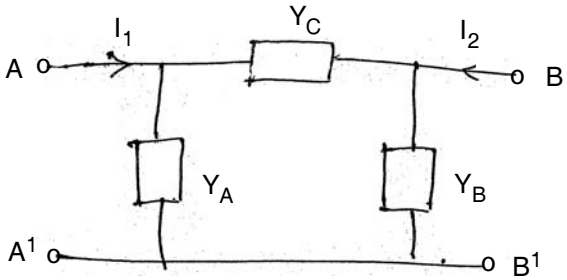


Set Q

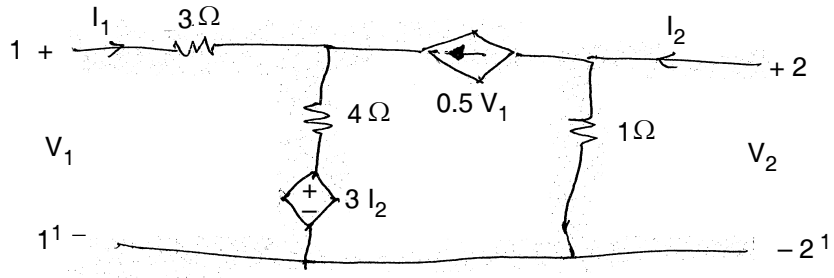
3) Derive an expression for resonant frequency for Parallel RLC circuit and hence find the resonant frequency for the circuit shown below.



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

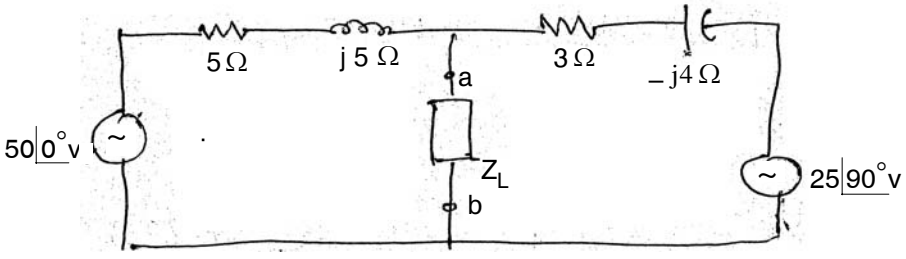


5) Determine h-parameters of the network.



3. Answer **any two** of the following. **(2×6 =12)**

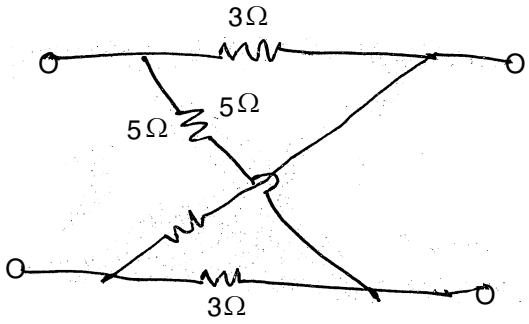
1) In the network shown two voltage sources act on a load impedance connected to the terminal a &b. If this load is variable in both reactance and resistance, what load ZL will receive the maximum power ? What is the value of Maximum Power ?



Set Q

2) Derive the expression for maximum voltage across and inductor in series RLC circuit. Determine the Quality factor for the coil if R = 10 Ω , L= 0.1H & C = 10 μ F connected in series.

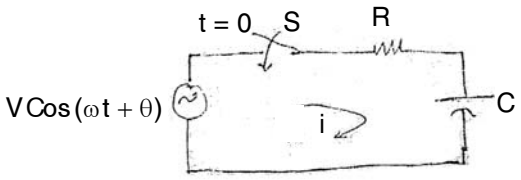
3) Determine the Z and h-parameters for the lattice network shown below.



SECTION – II

4. Solve **any four** : **(4x4=16)**

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

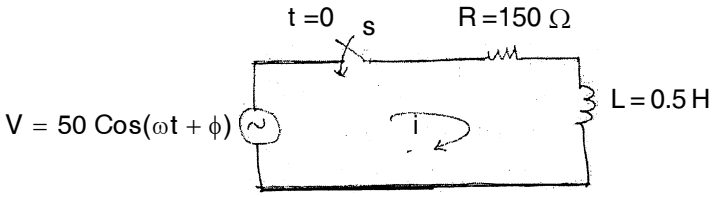


2) What is an attenuator ? State the necessity of it. Explain Lattice attenuator in detail.

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 Ω 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 + ϕ) is applied to the circuit at t = 0. Where ϕ =30°

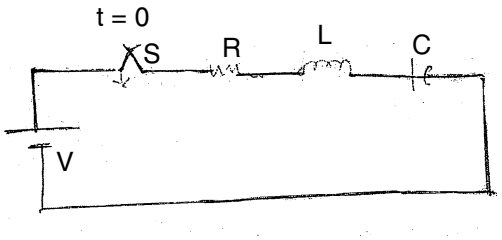


5. Solve **any two** : **(2×6=12)**

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

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 Ω , 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 Ω impedance.

SLR-EP – 127

Seat No.	

Set **R**

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 : **(1×14=14)**

1) For a given value of Q and Resonant frequency fr, bandwidth is given by
   a) fr/Q b) Fr × Q
   c) Q/ fr d) None of the above

2) Which parameters are widely used in transmission line theory ?
   a) Z b) Y c) h d) ABCD

3) 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

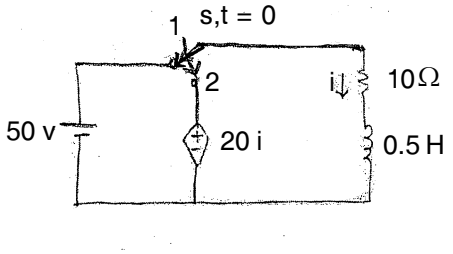
4) The transfer impedance is defined as
   a) The ratio of transform voltage to transform current at the same port
   b) The ratio of transform voltage at one port to transform current at the other port
   c) Both a & b
   d) None of the above

5) 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

6) 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) $\frac{V}{L}$

P.T.O.

7) For the circuit shown current in the 10 Ω resistance when the switch is changed from 1 to 2 is



a) $5e^{20t}$ b) $5e^{-20t}$ c) $20e^{5t}$ d) $20e^{-5t}$

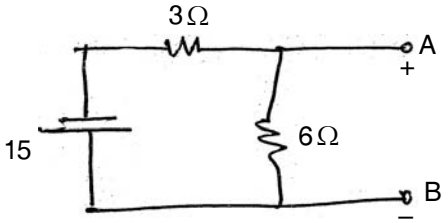
8) The transient current in loss free LC circuit when excited from AC source is an _____ sine wave.
a) un damped b) over damped
c) under damped d) critically damped

9) 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) $Cosh(Y)=1+Z_1/Z_2$

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 Ω b) 5A, 2 Ω c) –5A, 6 Ω d) –5A, 2 Ω

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

SLR-EP – 127

Seat No.	

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

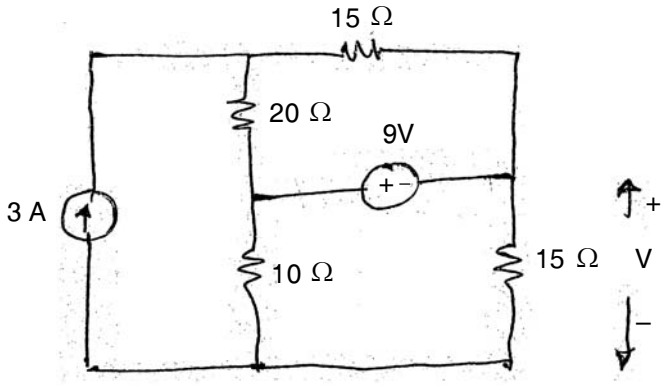
Day and Date : Saturday, 17-12-2016 Marks :56

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

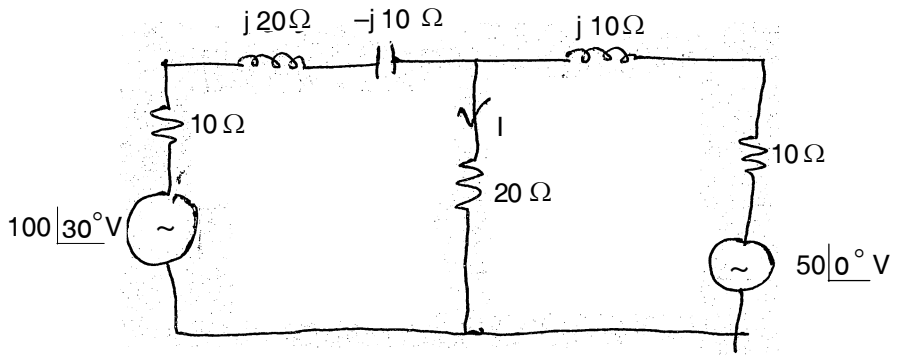
SECTION – I

2. Answer **any four** of the following. **(4×4 =16)**

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

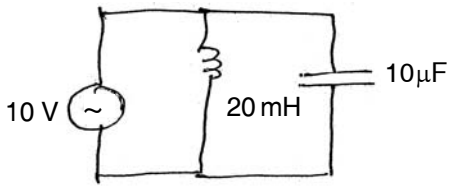


2) Draw the Norton's equivalent circuit for the network shown and hence find the current I

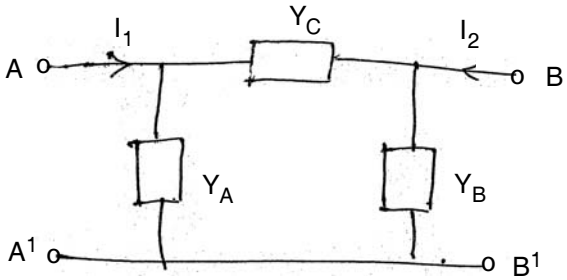


Set R

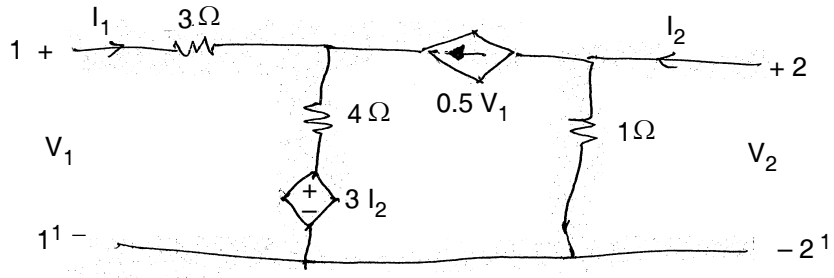
3) Derive an expression for resonant frequency for Parallel RLC circuit and hence find the resonant frequency for the circuit shown below.



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

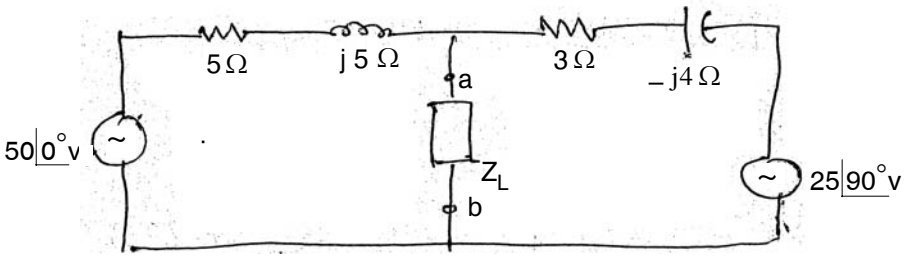


5) Determine h-parameters of the network.



3. Answer **any two** of the following. **(2×6 =12)**

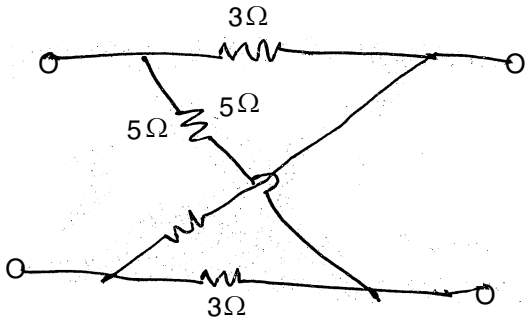
1) In the network shown two voltage sources act on a load impedance connected to the terminal a &b. If this load is variable in both reactance and resistance, what load ZL will receive the maximum power ? What is the value of Maximum Power ?



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 Ω , L= 0.1H & C = 10 μ F connected in series.

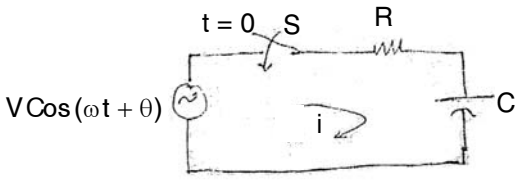
3) Determine the Z and h-parameters for the lattice network shown below.



SECTION – II

4. Solve **any four** : **(4x4=16)**

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

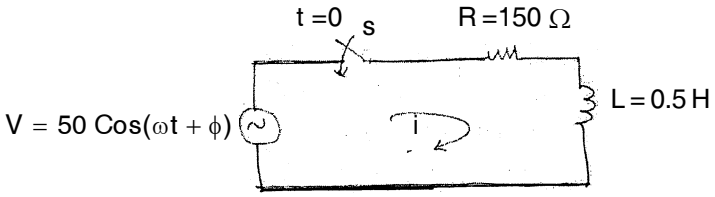


2) What is an attenuator ? State the necessity of it. Explain Lattice attenuator in detail.

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 Ω 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 + ϕ) is applied to the circuit at t = 0. Where ϕ =30°

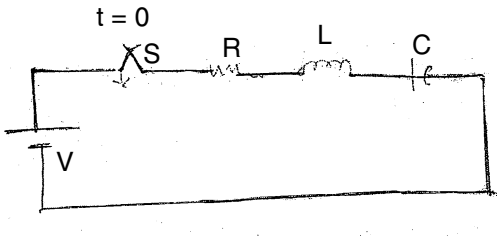


5. Solve **any two** : **(2×6=12)**

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

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 Ω , 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 Ω 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

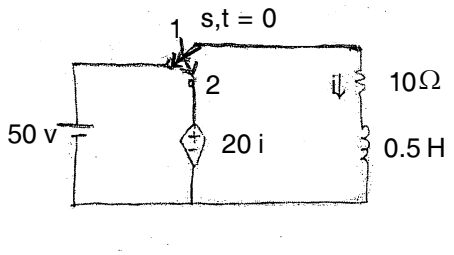
Duration : 30 Minutes Marks : 14

1. Choose the correct answer : **(1×14=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 Ω resistance when the switch is changed from 1 to 2 is



a) $5e^{20t}$ b) $5e^{-20t}$ c) $20e^{5t}$ d) $20e^{-5t}$

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

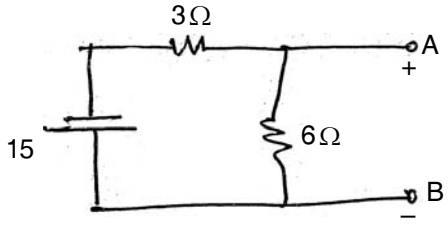
4) The propagation constant of symmetrical T-network is
a) $Cos(Y)=1+Z_1/2Z_2$ b) $Cosh(Y) = 1+Z_1/2Z_2$
c) $Cosh(Y) = 1+Z_1/4Z_2$ d) $Cosh(Y)=1+Z_1/Z_2$

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

P.T.O.

6) 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

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



   a) 5A, 3 Ω b) 5A, 2 Ω c) –5A, 6 Ω d) –5A, 2 Ω

8) Superposition theorem is not valid for
   a) Current responses b) Voltage responses
   c) Power responses d) Both a & b

9) 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

10) For a given value of Q and Resonant frequency fr, bandwidth is given by
   a) fr/Q b) Fr × Q
   c) Q/ fr d) None of the above

11) Which parameters are widely used in transmission line theory ?
   a) Z b) Y c) h d) ABCD

12) 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

13) 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

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

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SLR-EP – 127

Seat No.	

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

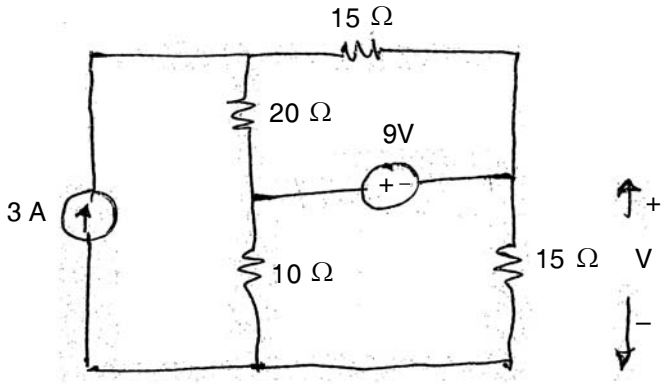
Day and Date : Saturday, 17-12-2016 Marks :56

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

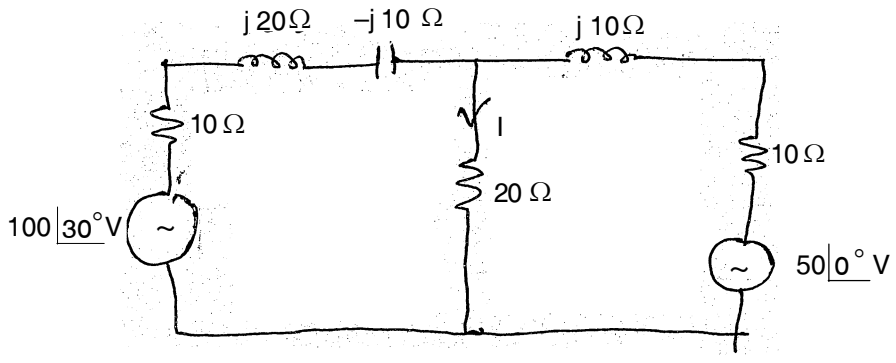
SECTION – I

2. Answer **any four** of the following. **(4×4 =16)**

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

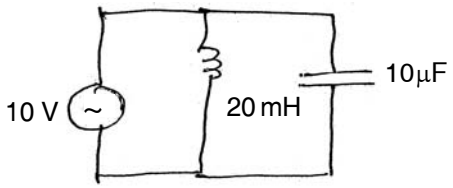


2) Draw the Norton's equivalent circuit for the network shown and hence find the current I

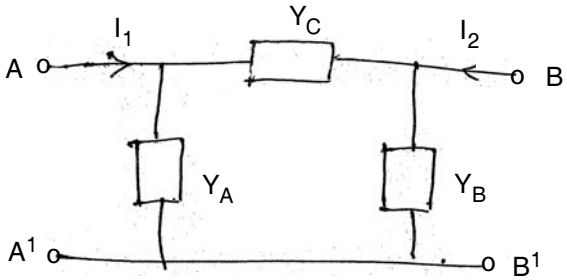


Set S

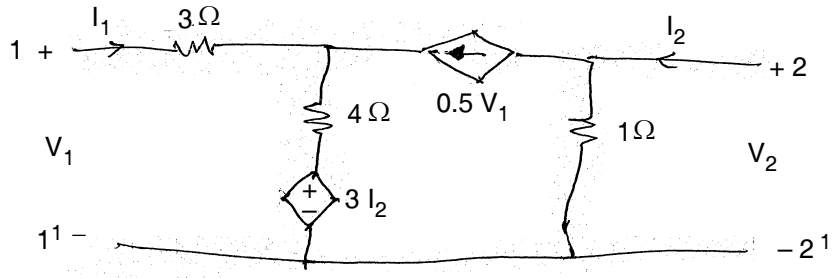
3) Derive an expression for resonant frequency for Parallel RLC circuit and hence find the resonant frequency for the circuit shown below.



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

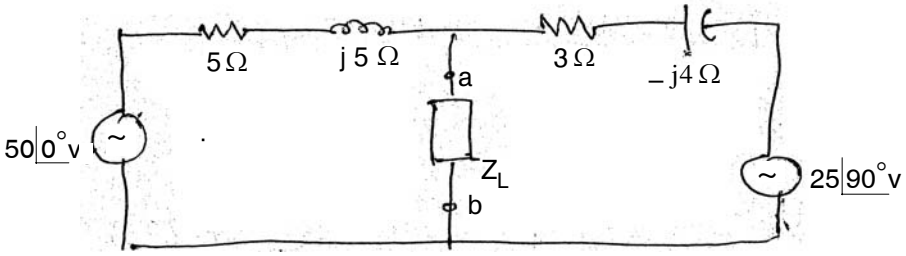


5) Determine h-parameters of the network.



3. Answer **any two** of the following. **(2×6 =12)**

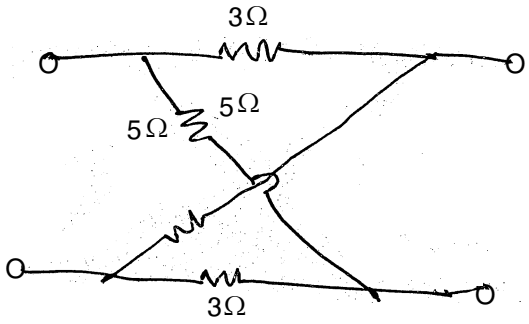
1) In the network shown two voltage sources act on a load impedance connected to the terminal a &b. If this load is variable in both reactance and resistance, what load ZL will receive the maximum power ? What is the value of Maximum Power ?



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 Ω , L= 0.1H & C = 10 μ F connected in series.

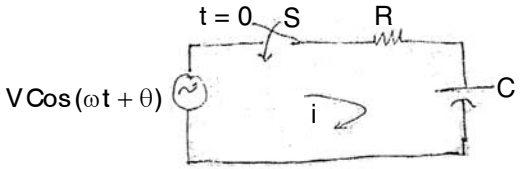
3) Determine the Z and h-parameters for the lattice network shown below.



SECTION – II

4. Solve **any four** : **(4x4=16)**

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

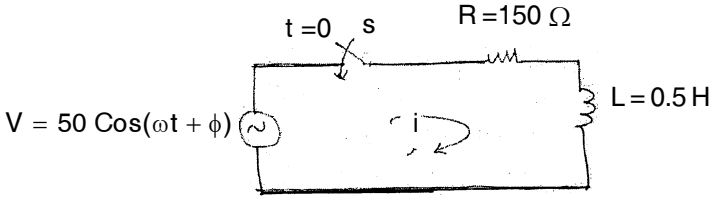


2) What is an attenuator ? State the necessity of it. Explain Lattice attenuator in detail.

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 Ω 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 + ϕ) is applied to the circuit at t = 0. Where ϕ =30°

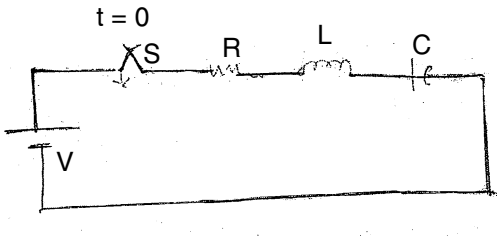


5. Solve **any two** : **(2×6=12)**

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

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 Ω , 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 Ω impedance.

SLR-EP – 128

Seat No.	

Set **P**

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 : **(14×1=14)**

1) Gray code is
   a) Non weighted code b) Cyclic code
   c) Reflected code d) All the above

2) A circuit that transforms decimal to binary code is
   a) Multiplexer b) Demultiplexer c) Decoder d) Encoder

3) 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

4) 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

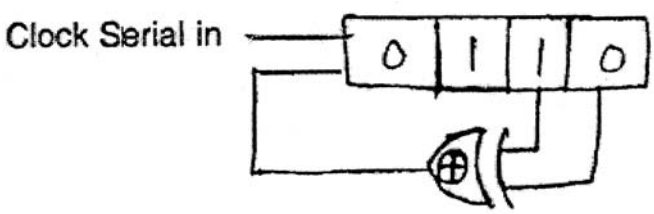
5) The number of stable states in one shot flip-flop is
   a) 1 b) 2 c) 3 d) 4

6) What is the condition for race around problem ?
   a) J=K=1 b) $\Delta t < t_p$ c) Both d) None

7) The logic expression for Y(A, B, C) = Σm (0, 2, 3, 6) is equivalent to
   a) Σm (1, 4, 5, 7) b) πM (0, 3, 5, 6, 7)
   c) Σm (1, 2, 4) d) None

8) 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

9) 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

10) 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

11) 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

12) The minimum number of flip-flops required to generate a sequence of 11 bits is
   a) 3 b) 4 c) 5 d) 2

13) State reduction gives
   a) Reduction in number of flip-flops b) Number of flip-flop remain same
   c) Either (a) or (b) d) None of these

14) In PLA
   a) Both 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

SLR-EP – 128

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** : **(4×4=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** : **(2×6=12)**
   a) Minimize the following function using K-map & implement reduced expression using NOR gate.
      $F = A B \overline{C} D + \overline{A} B C + \overline{A}\,\overline{B}\,\overline{C} + \overline{A}\,\overline{B}\,\overline{D} + A \overline{C} + A \overline{B} C + \overline{B}\,\overline{C} + \overline{C}$
   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

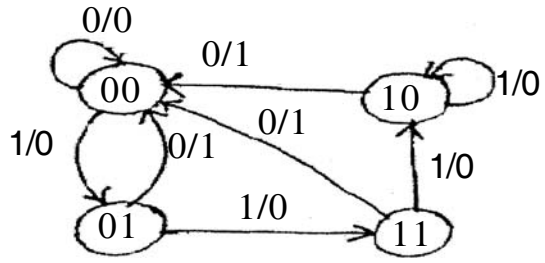
4. Solve **any four** : **(4×4=16)**
   a) Draw the waveforms to shift data 1101 to left in serial out shift register.
   b) Design MOD-5 asychronous counter.
   c) Design MOD-10 down counter using IC 74191.
   d) Compare Moore & Mealy machines.
   e) Draw the state diagram & give the state table for sequence detector which detects the sequence 1011.

Set P

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.

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SLR-EP – 128

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.

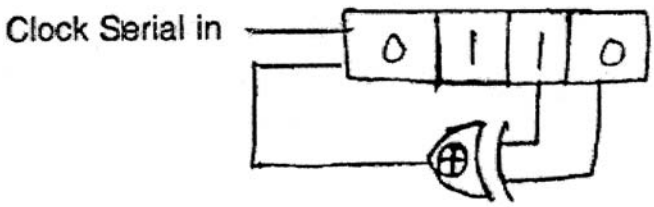
MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer : **(14×1=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

P.T.O.

6) State reduction gives
   a) Reduction in number of flip-flops b) Number of flip-flop remain same
   c) Either (a) or (b) d) None of these

7) In PLA
   a) Both 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

8) Gray code is
   a) Non weighted code b) Cyclic code
   c) Reflected code d) All the above

9) A circuit that transforms decimal to binary code is
   a) Multiplexer b) Demultiplexer c) Decoder d) Encoder

10) 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

11) 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

12) The number of stable states in one shot flip-flop is
   a) 1 b) 2 c) 3 d) 4

13) What is the condition for race around problem ?
   a) J=K=1 b) $\Delta t < t_p$ c) Both d) None

14) The logic expression for Y(A, B, C) = Σm (0, 2, 3, 6) is equivalent to
   a) Σm (1, 4, 5, 7) b) πM (0, 3, 5, 6, 7)
   c) Σm (1, 2, 4) d) None

SLR-EP – 128

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** : **(4×4=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** : **(2×6=12)**
   a) Minimize the following function using K-map & implement reduced expression using NOR gate.
      $F = A B \overline{C} D + \overline{A} B C + \overline{A}\,\overline{B}\,\overline{C} + \overline{A}\,\overline{B}\,\overline{D} + A \overline{C} + A \overline{B} C + \overline{B}\,\overline{C} + \overline{C}$
   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

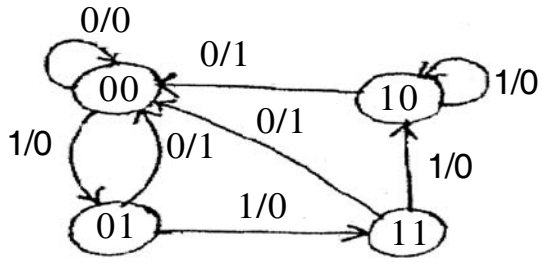
4. Solve **any four** : **(4×4=16)**
   a) Draw the waveforms to shift data 1101 to left in serial out shift register.
   b) Design MOD-5 asychronous counter.
   c) Design MOD-10 down counter using IC 74191.
   d) Compare Moore & Mealy machines.
   e) Draw the state diagram & give the state table for sequence detector which detects the sequence 1011.

Set Q

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.

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SLR-EP – 128

Seat No.	

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 : **(14×1=14)**

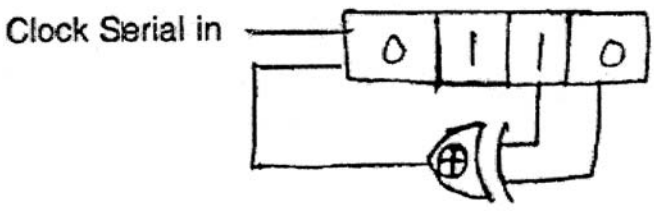
1) The number of stable states in one shot flip-flop is
a) 1 b) 2 c) 3 d) 4

2) What is the condition for race around problem ?
a) J=K=1 b) $\Delta t < t_p$ c) Both d) None

3) The logic expression for Y(A, B, C) = Σm (0, 2, 3, 6) is equivalent to
a) Σm (1, 4, 5, 7) b) πM (0, 3, 5, 6, 7)
c) Σm (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

P.T.O.

7) 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
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13) 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

14) 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

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SLR-EP – 128

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** : **(4×4=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** : **(2×6=12)**
   a) Minimize the following function using K-map & implement reduced expression using NOR gate.
      $F = A B \overline{C} D + \overline{A} B C + \overline{A}\,\overline{B}\,\overline{C} + \overline{A}\,\overline{B}\,\overline{D} + A \overline{C} + A \overline{B} C + \overline{B}\,\overline{C} + \overline{C}$
   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

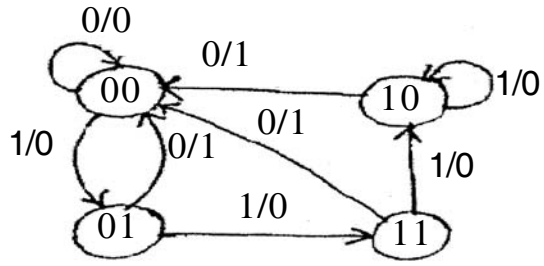
4. Solve **any four** : **(4×4=16)**
   a) Draw the waveforms to shift data 1101 to left in serial out shift register.
   b) Design MOD-5 asychronous counter.
   c) Design MOD-10 down counter using IC 74191.
   d) Compare Moore & Mealy machines.
   e) Draw the state diagram & give the state table for sequence detector which detects the sequence 1011.

Set R

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.

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SLR-EP – 128

Seat No.	

Set S

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 : **(14×1=14)**

1) 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

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a) 5 b) 10 c) 11 d) 15

3) The minimum number of flip-flops required to generate a sequence of 11 bits is
a) 3 b) 4 c) 5 d) 2

4) State reduction gives
a) Reduction in number of flip-flops b) Number of flip-flop remain same
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5) In PLA
a) Both AND and OR matrix are programmable
b) AND array is fixed and OR is programmable
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d) None of the above

6) Gray code is
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c) Reflected code d) All the above

7) A circuit that transforms decimal to binary code is
a) Multiplexer b) Demultiplexer c) Decoder d) Encoder

P.T.O.

8) A 7-segment LED display with common anode requires
   a) BCD to 7-segment decoder with active-low outputs
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   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
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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) = Σm (0, 2, 3, 6) is equivalent to
   a) Σm (1, 4, 5, 7) b) πM (0, 3, 5, 6, 7)
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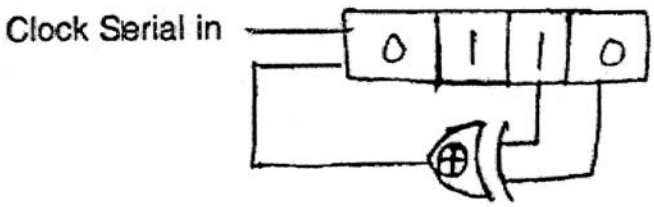
14) The initial content of 4-bit serial-in-parallel out, right shift, shift register shown in figure is 0110. After three clock pulses are applied contents of shift register will be ?



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

SLR-EP – 128

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** : **(4×4=16)**
   a) Reduce the following logical expression using K-map and implement reduced expression by using NAND gate.
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   b) Implement 8 : 1 MUX by using 2 : 1 MUX.
   c) Implement the following function using single 8 : 1 multiplexer
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   d) Convert T flip flop into D flip-flop.
   e) Draw and explain CMOS inverter.

3. Solve **any two** : **(2×6=12)**
   a) Minimize the following function using K-map & implement reduced expression using NOR gate.
      $F = A B \overline{C} D + \overline{A} B C + \overline{A}\,\overline{B}\,\overline{C} + \overline{A}\,\overline{B}\,\overline{D} + A \overline{C} + A \overline{B} C + \overline{B}\,\overline{C} + \overline{C}$
   b) Draw & Explain Subtractor using adder IC 7483 (Use 2's Complement Method).
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SECTION – II

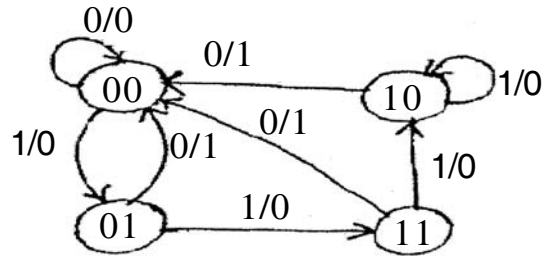
4. Solve **any four** : **(4×4=16)**
   a) Draw the waveforms to shift data 1101 to left in serial out shift register.
   b) Design MOD-5 asychronous counter.
   c) Design MOD-10 down counter using IC 74191.
   d) Compare Moore & Mealy machines.
   e) Draw the state diagram & give the state table for sequence detector which detects the sequence 1011.

Set S

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.

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SLR-EP – 129

Seat No.	

Set P

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 : **(14×1=14)**

1) 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

2) Recursively the fib(5) is
   a) 2 b) 3 c) 5 d) 8

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

4) 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
   d) None of the above

5) The end from which an element gets removed from the queue is called
   a) Front b) Rear c) Top d) Bottom

6) _____ is the application of stack.
   a) Execution of sub program b) Conversion of infix to postfix
   c) Both a), b) d) None of the above

P.T.O.

7) Queue follows algorithm
   a) FIFO b) LIFO c) RANDOM d) LILO

8) 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

9) 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

10) 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

11) 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

12) 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

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 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

SLR-EP – 129

Seat No.	

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

Day and Date : Thursday, 22-12-2016 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

SECTION – I

2. Attempt **any four** questions : **(4×3=12)**

   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 ^ 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.

SECTION – II

5. Attempt **any four** questions : **(4×3=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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SLR-EP – 129

Seat No.	

Set Q

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 : **(14×1=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

P.T.O.

6) 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

7) 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

8) 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

9) Recursively the fib(5) is
   a) 2 b) 3 c) 5 d) 8

10) 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

11) 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
   d) None of the above

12) The end from which an element gets removed from the queue is called
   a) Front b) Rear c) Top d) Bottom

13) _____ is the application of stack.
   a) Execution of sub program b) Conversion of infix to postfix
   c) Both a), b) d) None of the above

14) Queue follows algorithm
   a) FIFO b) LIFO c) RANDOM d) LILO

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SLR-EP – 129

Seat No.	

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

Day and Date : Thursday, 22-12-2016 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

SECTION – I

2. Attempt **any four** questions : **(4×3=12)**

   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 ^ 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.

Set Q

SECTION – II

5. Attempt **any four** questions : **(4×3=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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SLR-EP – 129

Seat No.	

Set R

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 : **(14×1=14)**

1) The end from which an element gets removed from the queue is called
a) Front b) Rear c) Top d) Bottom

2) _____ is the application of stack.
a) Execution of sub program b) Conversion of infix to postfix
c) Both a), b) d) None of the above

3) Queue follows algorithm
a) FIFO b) LIFO c) RANDOM d) LILO

4) 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

5) 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

6) 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

7) 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

8) 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

9) 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

10) 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

11) 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

12) Recursively the fib(5) is
   a) 2 b) 3 c) 5 d) 8

13) 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

14) 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
   d) None of the above

SLR-EP – 129

Seat No.	

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

Day and Date : Thursday, 22-12-2016 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

SECTION – I

2. Attempt **any four** questions : **(4×3=12)**
   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 ^ 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.

SECTION – II

5. Attempt **any four** questions : **(4×3=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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SLR-EP – 129

Seat No.	

Set S

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 : **(14×1=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 in
   a) Singly Linked List b) Doubly Linked List
   c) Circular Linked List d) None of the above

7) Recursively the fib(5) is
   a) 2 b) 3 c) 5 d) 8

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

9) 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
   d) None of the above

10) The end from which an element gets removed from the queue is called
   a) Front b) Rear c) Top d) Bottom

11) _____ is the application of stack.
   a) Execution of sub program b) Conversion of infix to postfix
   c) Both a), b) d) None of the above

12) Queue follows algorithm
   a) FIFO b) LIFO c) RANDOM d) LILO

13) 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

14) 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

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SLR-EP – 129

Seat No.	

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

Day and Date : Thursday, 22-12-2016 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

SECTION – I

2. Attempt **any four** questions : **(4×3=12)**

   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 ^ 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.

SECTION – II

5. Attempt **any four** questions : **(4×3=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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SLR-EP – 130

Seat No.	

Set P

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.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct alternative : **(14×1=14)**

1) The gain of an amplifier is expressed in db because
   a) it is a simple unit
   b) human ear response is good for logarithmic scale
   c) calculations become easy
   d) none of the above

2) Which one of the following is most suitable for generating 100Hz signal ?
   a) Hartley oscillator b) Copitts oscillator
   c) Wein bridge oscillator d) Crystal oscillator

3) For Wein bridge oscillator a variable capacitor with lower limit 47 pF and upper limit 470 pF is used what should be the value of fixed resistance required to provide upper frequency limits of 200 KHz ?
   a) 16.92 KΩ b) 20.92 KΩ
   c) 30.92 KΩ d) None of the above

4) _____ coupling is generally employed in power amplifiers.
   a) Transformer b) RC c) Direct d) Impedance

5) If a transistor is operated in such a way that output current flows for 60° of the input signal, then it is _____ operation.
   a) class A b) class B
   c) class C d) none of the above

P.T.O.

6) When emitter bypass capacitor is removed from RC coupled amplifier circuit it results to

a) voltage series negative feedback b) voltage shunt negative feedback

c) current series negative feedback d) current shunt negative feedback

7) If the power rating of a transistor is 1 W and collector current is 100 mA, then maximum allowable collector voltage is

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 regulator

c) As a current regulator and a power switch

d) As a current regulator alone

9) Pre regulator in voltage regulator acts as

a) Reference voltage source b) Constant current source

c) Pre amplifier d) All above

10) The reference voltage and dropout voltage for fixed voltage regulator 7812 respectively are

a) 2V, 9V b) 14V, 2V c) 12V, 2V d) 9V, 9V

11) Schmitt Trigger acts as a _____ multivibrator.

a) Astable b) Monostable c) Bistable d) None

12) It is required to stretch a 5 μ sec pulse to duration of 5msec. An appropriate circuit to be used for this is

a) Monostable Multivibrator b) Astable Multivibrator

c) Schmitt Trigger d) Bistable Multivibrator

13) The Pin no. 1, 2, 3 for LM-337 are _____ respectively.

a) Vin, Vout, Iadj b) Iadj, Vin, Vout c) Iadj, Vout, Vin d) Vin, Iadj, Vout

14) In a transistorized monostable multivibrator, quasi stable duration is

a) 0.7RC b) 1.7RC c) 1.4RC d) none

_____

SLR-EP – 130

Seat No.	

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 KΩ , R = 5.6 KΩ , 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. **(2×6 =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.

SECTION – II

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 Ω)

   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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SLR-EP – 130

Seat No.	

Set Q

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.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct alternative : **(14×1=14)**

1) A three terminal monolithic IC regulator can be used as
   a) An adjustable O/P voltage regulator alone
   b) An adjustable O/P voltage regulator and current regulator
   c) As a current regulator and a power switch
   d) As a current regulator alone

2) Pre regulator in voltage regulator acts as
   a) Reference voltage source b) Constant current source
   c) Pre amplifier d) All above

3) The reference voltage and dropout voltage for fixed voltage regulator 7812 respectively are
   a) 2V, 9V b) 14V, 2V c) 12V, 2V d) 9V, 9V

4) Schmitt Trigger acts as a _____ multivibrator.
   a) Astable b) Monostable c) Bistable d) None

5) It is required to stretch a 5 μ sec pulse to duration of 5msec. An appropriate circuit to be used for this is
   a) Monostable Multivibrator b) Astable Multivibrator
   c) Schmitt Trigger d) Bistable Multivibrator

P.T.O.

6) The Pin no. 1, 2, 3 for LM-337 are _____ respectively.

a) Vin, Vout, Iadj b) Iadj, Vin, Vout c) Iadj, Vout, Vin d) Vin, Iadj, Vout

7) In a transistorized monostable multivibrator, quasi stable duration is

a) 0.7RC b) 1.7RC c) 1.4RC d) none

8) The gain of an amplifier is expressed in db because

a) it is a simple unit

b) human ear response is good for logarithmic scale

c) calculations become easy

d) none of the above

9) Which one of the following is most suitable for generating 100Hz signal ?

a) Hartley oscillator b) Copitts oscillator

c) Wein bridge oscillator d) Crystal oscillator

10) For Wein bridge oscillator a variable capacitor with lower limit 47 pF and upper limit 470 pF is used what should be the value of fixed resistance required to provide upper frequency limits of 200 KHz ?

a) 16.92 KΩ b) 20.92 KΩ

c) 30.92 KΩ d) None of the above

11) _____ coupling is generally employed in power amplifiers.

a) Transformer b) RC c) Direct d) Impedance

12) If a transistor is operated in such a way that output current flows for 60° of the input signal, then it is _____ operation.

a) class A b) class B

c) class C d) none of the above

13) When emitter bypass capacitor is removed from RC coupled amplifier circuit it results to

a) voltage series negative feedback b) voltage shunt negative feedback

c) current series negative feedback d) current shunt negative feedback

14) If the power rating of a transistor is 1 W and collector current is 100 mA, then maximum allowable collector voltage is

a) 1 V b) 100 V c) 20 V d) 10 V

_____

SLR-EP – 130

Seat No.	

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 KΩ , R = 5.6 KΩ , 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. **(2×6 =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.

SECTION – II

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 Ω)

   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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SLR-EP – 130

Seat No.	

Set **R**

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.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct alternative : **(14×1=14)**

1) If a transistor is operated in such a way that output current flows for 60° of the input signal, then it is _____ operation.

a) class A b) class B

c) class C d) none of the above

2) When emitter bypass capacitor is removed from RC coupled amplifier circuit it results to

a) voltage series negative feedback b) voltage shunt negative feedback

c) current series negative feedback d) current shunt negative feedback

3) If the power rating of a transistor is 1 W and collector current is 100 mA, then maximum allowable collector voltage is

a) 1 V b) 100 V c) 20 V d) 10 V

4) A three terminal monolithic IC regulator can be used as

a) An adjustable O/P voltage regulator alone

b) An adjustable O/P voltage regulator and current regulator

c) As a current regulator and a power switch

d) As a current regulator alone

5) Pre regulator in voltage regulator acts as

a) Reference voltage source b) Constant current source

c) Pre amplifier d) All above

6) The reference voltage and dropout voltage for fixed voltage regulator 7812 respectively are

a) 2V, 9V b) 14V, 2V c) 12V, 2V d) 9V, 9V

7) Schmitt Trigger acts as a _____ multivibrator.

a) Astable b) Monostable c) Bistable d) None

8) It is required to stretch a 5 μ sec pulse to duration of 5msec. An appropriate circuit to be used for this is

a) Monostable Multivibrator b) Astable Multivibrator

c) Schmitt Trigger d) Bistable Multivibrator

9) The Pin no. 1, 2, 3 for LM-337 are _____ respectively.

a) Vin, Vout, Iadj b) Iadj, Vin, Vout c) Iadj, Vout, Vin d) Vin, Iadj, Vout

10) In a transistorized monostable multivibrator, quasi stable duration is

a) 0.7RC b) 1.7RC c) 1.4RC d) none

11) The gain of an amplifier is expressed in db because

a) it is a simple unit

b) human ear response is good for logarithmic scale

c) calculations become easy

d) none of the above

12) Which one of the following is most suitable for generating 100Hz signal ?

a) Hartley oscillator b) Copitts oscillator

c) Wein bridge oscillator d) Crystal oscillator

13) For Wein bridge oscillator a variable capacitor with lower limit 47 pF and upper limit 470 pF is used what should be the value of fixed resistance required to provide upper frequency limits of 200 KHz ?

a) 16.92 KΩ b) 20.92 KΩ

c) 30.92 KΩ d) None of the above

14) _____ coupling is generally employed in power amplifiers.

a) Transformer b) RC c) Direct d) Impedance

_____

SLR-EP – 130

Seat No.	

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 KΩ , R = 5.6 KΩ , 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. **(2×6 =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.

SECTION – II

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 Ω)

   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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SLR-EP – 130

Seat No.	

Set **S**

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.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct alternative : **(14×1=14)**

1) The reference voltage and dropout voltage for fixed voltage regulator 7812 respectively are
   a) 2V, 9V b) 14V, 2V c) 12V, 2V d) 9V, 9V
2) Schmitt Trigger acts as a _____ multivibrator.
   a) Astable b) Monostable c) Bistable d) None
3) It is required to stretch a 5 μ sec pulse to duration of 5msec. An appropriate circuit to be used for this is
   a) Monostable Multivibrator b) Astable Multivibrator
   c) Schmitt Trigger d) Bistable Multivibrator
4) The Pin no. 1, 2, 3 for LM-337 are _____ respectively.
   a) Vin, Vout, Iadj b) Iadj, Vin, Vout c) Iadj, Vout, Vin d) Vin, Iadj, Vout
5) In a transistorized monostable multivibrator, quasi stable duration is
   a) 0.7RC b) 1.7RC c) 1.4RC d) none
6) The gain of an amplifier is expressed in db because
   a) it is a simple unit
   b) human ear response is good for logarithmic scale
   c) calculations become easy
   d) none of the above

7) Which one of the following is most suitable for generating 100Hz signal ?

a) Hartley oscillator b) Copitts oscillator

c) Wein bridge oscillator d) Crystal oscillator

8) For Wein bridge oscillator a variable capacitor with lower limit 47 pF and upper limit 470 pF is used what should be the value of fixed resistance required to provide upper frequency limits of 200 KHz ?

a) 16.92 KΩ b) 20.92 KΩ

c) 30.92 KΩ d) None of the above

9) _____ coupling is generally employed in power amplifiers.

a) Transformer b) RC c) Direct d) Impedance

10) If a transistor is operated in such a way that output current flows for 60° of the input signal, then it is _____ operation.

a) class A b) class B

c) class C d) none of the above

11) When emitter bypass capacitor is removed from RC coupled amplifier circuit it results to

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 W and collector current is 100 mA, then maximum allowable collector voltage is

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 switch

d) As a current regulator alone

14) Pre regulator in voltage regulator acts as

a) Reference voltage source b) Constant current source

c) Pre amplifier d) All above

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SLR-EP – 130

Seat No.	

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 KΩ , R = 5.6 KΩ , 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. **(2×6 =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.

SECTION – II

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 Ω)

   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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SLR-EP – 131

Seat No.	

Set **P**

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 : **(14×1=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 proportional to frequency
   b) directly proportional to frequency
   c) independent of frequency
   d) is constant over all frequencies

7) Perfect modulation occurs when
   a) Vm > Vc b) Vm < Vc c) Vm = Vc d) Vm = Vc = 0

8) 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)

9) In FM sound broadcasting system, the maximum frequency deviation is usually
   a) 15 kHz b) 75 kHz c) 100 kHz d) 5.2 MHz

10) Good selectivity usually means _____ Bandwidth.
   a) Wide b) Narrow c) Phase d) None of these

11) In FM for a given frequency deviation the modulation index varies
   a) inversely as the modulating frequency
   b) directly as the modulating frequency
   c) independent of the changes in modulating signal
   d) none of the above

12) Ground waves have the following characteristic
   a) Progress along the surface of earth
   b) Must be vertically polarized
   c) Lies down and dies at some distance from the antenna
   d) All of the above

13) A folded dipole consists of
   a) Single element b) Two elements
   c) Four elements d) Three elements

14) 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 Hz

SLR-EP – 131

Seat No.	

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** : **(4×3=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** : **(8×2=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.

SECTION – II

4. Attempt **any three** : **(4×3=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** : **(8×2=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.

SLR-EP – 131

Seat No.	

Set Q

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 : **(14×1=14)**

1) 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)

2) In FM sound broadcasting system, the maximum frequency deviation is usually
   a) 15 kHz b) 75 kHz c) 100 kHz d) 5.2 MHz

3) Good selectivity usually means _____ Bandwidth.
   a) Wide b) Narrow c) Phase d) None of these

4) In FM for a given frequency deviation the modulation index varies
   a) inversely as the modulating frequency
   b) directly as the modulating frequency
   c) independent of the changes in modulating signal
   d) none of the above

5) Ground waves have the following characteristic
   a) Progress along the surface of earth
   b) Must be vertically polarized
   c) Lies down and dies at some distance from the antenna
   d) All of the above

P.T.O.

6) A folded dipole consists of
   a) Single element b) Two elements
   c) Four elements d) Three elements

7) 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 Hz

8) 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

9) 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

10) Vestigial sideband modulation is used for transmission of
   a) HF point to point communication b) Monaural broadcasting
   c) TV broadcasting d) Stereo broadcasting

11) 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

12) 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

13) Flicker noise is
   a) inversely proportional to frequency
   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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Seat No.	

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** : **(4×3=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** : **(8×2=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.

Set Q

SECTION – II

4. Attempt **any three** : **(4×3=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** : **(8×2=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.

SLR-EP – 131

Seat No.	

Set R

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 : **(14×1=14)**

1) 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

P.T.O.

6) Good selectivity usually means _____ Bandwidth.
   a) Wide b) Narrow c) Phase d) None of these

7) In FM for a given frequency deviation the modulation index varies
   a) inversely as the modulating frequency
   b) directly as the modulating frequency
   c) independent of the changes in modulating signal
   d) none of the above

8) Ground waves have the following characteristic
   a) Progress along the surface of earth
   b) Must be vertically polarized
   c) Lies down and dies at some distance from the antenna
   d) All of the above

9) A folded dipole consists of
   a) Single element b) Two elements
   c) Four elements d) Three elements

10) 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 Hz

11) 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

12) 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

13) Vestigial sideband modulation is used for transmission of
   a) HF point to point communication b) Monaural broadcasting
   c) TV broadcasting d) Stereo broadcasting

14) 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

_____

SLR-EP – 131

Seat No.	

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** : **(4×3=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** : **(8×2=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.

Set R

SECTION – II

4. Attempt **any three** : **(4×3=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** : **(8×2=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.

SLR-EP – 131

Seat No.	

Set **S**

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 : **(14×1=14)**

1) Good selectivity usually means _____ Bandwidth.

a) Wide b) Narrow c) Phase d) None of these

2) In FM for a given frequency deviation the modulation index varies

a) inversely as the modulating frequency

b) directly as the modulating frequency

c) independent of the changes in modulating signal

d) none of the above

3) Ground waves have the following characteristic

a) Progress along the surface of earth

b) Must be vertically polarized

c) Lies down and dies at some distance from the antenna

d) All of the above

4) A folded dipole consists of

a) Single element b) Two elements

c) Four elements d) Three elements

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 Hz

6) 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

7) 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

8) Vestigial sideband modulation is used for transmission of
   a) HF point to point communication b) Monaural broadcasting
   c) TV broadcasting d) Stereo broadcasting

9) 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

10) 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

11) Flicker noise is
   a) inversely proportional to frequency
   b) directly proportional to frequency
   c) independent of frequency
   d) is constant over all frequencies

12) Perfect modulation occurs when
   a) Vm > Vc b) Vm < Vc c) Vm = Vc d) Vm = Vc = 0

13) 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)

14) In FM sound broadcasting system, the maximum frequency deviation is usually
   a) 15 kHz b) 75 kHz c) 100 kHz d) 5.2 MHz

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SLR-EP – 131

Seat No.	

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** : **(4×3=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** : **(8×2=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.

SECTION – II

4. Attempt **any three** : **(4×3=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** : **(8×2=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.

SLR-EP – 132

Seat No.	

Set **P**

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) The viscous friction coefficient, in force-voltage analogy, is analogous to
   a) Charge b) Resistance
   c) Reciprocal of inductance d) Reciprocal of conductance

2) The type 1 system has _____ at the origin.
   a) No pole b) No zero
   c) Simple pole d) Two poles

3) 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

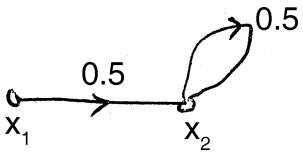
4) The damping ratio of a system having the characteristic equation $S^2 + 2S + 8 = 0$ is
   a) 0.353 b) 0.330 c) 0.300 d) 0.250

5) 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

6) 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

P.T.O.

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) $-\infty$

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° b) –180° c) –270° 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

SLR-EP – 132

Seat No.	

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

Day and Date : Wednesday, 23-11-2016 Marks : 56
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.

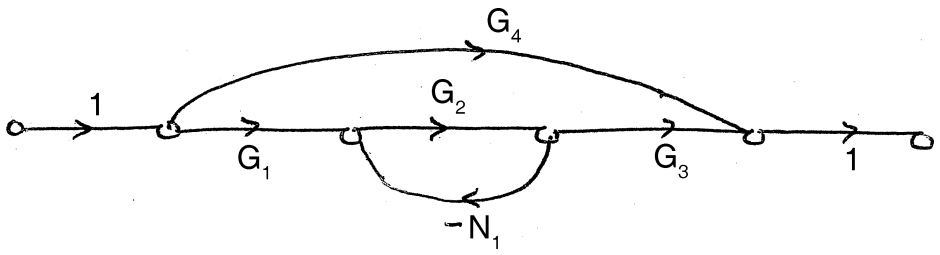
d) Explain special cases in Routh's criterion.

e) Explain the procedure of block diagram reduction technique.

3. a) Find the stability of a system having characteristic equation
$S^6 + 2S^5 + 7S^4 + 10S^3 + 14S^2 + 8S + 8 = 0$. **6**

b) Solve **any one** : **6**

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



ii) Define the following :

1) Path
2) Forward path
3) Loop
4) Loop gain
5) Path gain
6) Non-touching loops.

SECTION – II

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

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

   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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Seat No.	

Set **Q**

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) The starting point of root loci are the location of pole when K =
a) 0 b) 1 c) ∞ d) $-\infty$

2) 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) $\frac{1}{\delta w_r}$

3) Lag compensator reduces
a) Bandwidth b) Rise time
c) Transient response d) All of the above

4) 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° b) –180°
c) –270° d) –360°

5) 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

6) 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

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

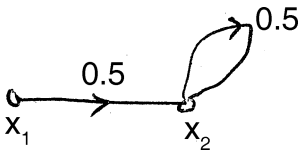
10) The equation $2S^4 + S^3 + 3S^2 + 5S + 10 = 0$ has _____ roots in the right half of S-plane.
   a) One b) Two c) Three d) Four

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

_____

SLR-EP – 132

Seat No.	

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

Day and Date : Wednesday, 23-11-2016 Marks : 56
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.

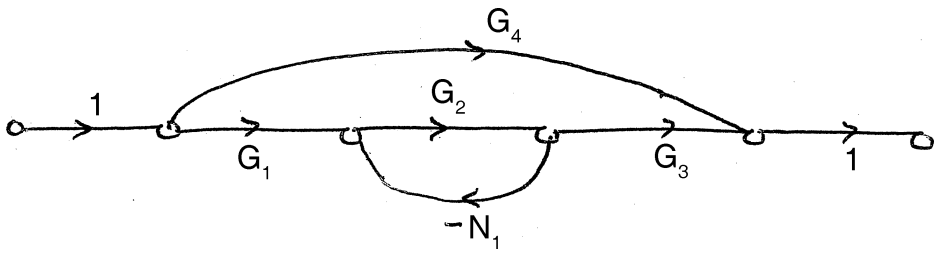
d) Explain special cases in Routh's criterion.

e) Explain the procedure of block diagram reduction technique.

3. a) Find the stability of a system having characteristic equation
$S^6 + 2S^5 + 7S^4 + 10S^3 + 14S^2 + 8S + 8 = 0$. **6**

b) Solve **any one** : **6**

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



ii) Define the following :

1) Path
2) Forward path
3) Loop
4) Loop gain
5) Path gain
6) Non-touching loops.

Set Q

SECTION – II

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

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

   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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Seat No.	

Set **R**

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**

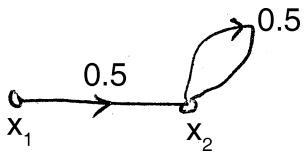
1) If the transfer function of a first-order system is $G(S) = \frac{10}{1+2S}$, then the time-constant of the system is

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 =

a) 0 b) 1 c) ∞ d) $-\infty$

5) 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) $\frac{1}{\delta w_r}$

6) Lag compensator reduces
   a) Bandwidth b) Rise time
   c) Transient response d) All of the above

7) 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° b) –180° c) –270° d) –360°

8) 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

9) 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

10) $f(t) = A \cdot \delta(t)$ in this equation 'A' stands for
   a) Function in time domain b) Function strength
   c) Deviation in time domain d) All of the above

11) The viscous friction coefficient, in force-voltage analogy, is analogous to
   a) Charge b) Resistance
   c) Reciprocal of inductance d) Reciprocal of conductance

12) The type 1 system has _____ at the origin.
   a) No pole b) No zero
   c) Simple pole d) Two poles

13) 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

14) 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

_____

SLR-EP – 132

Seat No.	

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

Day and Date : Wednesday, 23-11-2016 Marks : 56
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.

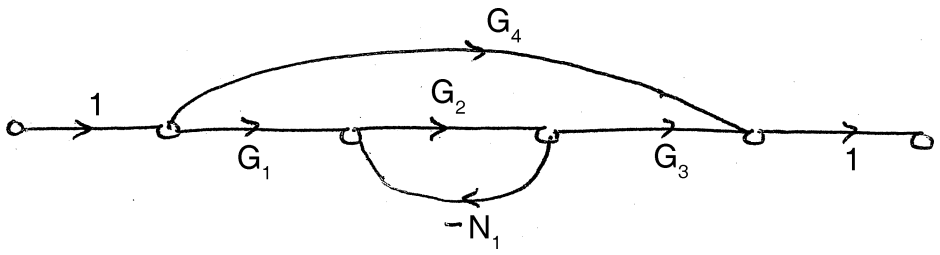
d) Explain special cases in Routh's criterion.

e) Explain the procedure of block diagram reduction technique.

3. a) Find the stability of a system having characteristic equation
$S^6 + 2S^5 + 7S^4 + 10S^3 + 14S^2 + 8S + 8 = 0$. **6**

b) Solve **any one** : **6**

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



ii) Define the following :

1) Path
2) Forward path
3) Loop
4) Loop gain
5) Path gain
6) Non-touching loops.

SECTION – II

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

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

   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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Seat No.	

Set **S**

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) Lag compensator reduces
   a) Bandwidth b) Rise time
   c) Transient response d) All of the above

2) 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° b) –180°
   c) –270° d) –360°

3) For $G(S) = \dfrac{K}{S(S+1)(S+2)(S+3)}$, the number of asymptotes are
   a) 1 b) 2 c) 3 d) 4

4) 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

5) $f(t) = A \cdot \delta(t)$ in this equation 'A' stands for
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6) The viscous friction coefficient, in force-voltage analogy, is analogous to
   a) Charge b) Resistance
   c) Reciprocal of inductance d) Reciprocal of conductance

7) The type 1 system has _____ at the origin.
   a) No pole b) No zero
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8) The equation $2S^4 + S^3 + 3S^2 + 5S + 10 = 0$ has _____ roots in the right half of S-plane.
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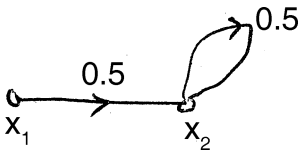
9) The damping ratio of a system having the characteristic equation $S^2 + 2S + 8 = 0$ is
   a) 0.353 b) 0.330 c) 0.300 d) 0.250

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



   a) 1 b) 9 c) 8 d) 12

13) The starting point of root loci are the location of pole when K =
   a) 0 b) 1 c) ∞ d) $-\infty$

14) 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) $\frac{1}{\delta w_r}$

_____

SLR-EP – 132

Seat No.	

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

Day and Date : Wednesday, 23-11-2016 Marks : 56
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.

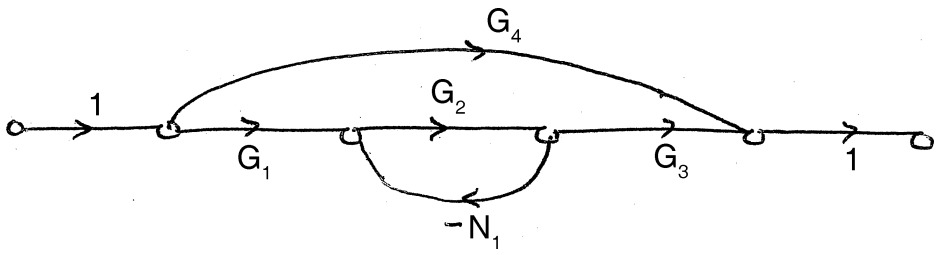
d) Explain special cases in Routh's criterion.

e) Explain the procedure of block diagram reduction technique.

3. a) Find the stability of a system having characteristic equation
$S^6 + 2S^5 + 7S^4 + 10S^3 + 14S^2 + 8S + 8 = 0$. **6**

b) Solve **any one** : **6**

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



ii) Define the following :

1) Path
2) Forward path
3) Loop
4) Loop gain
5) Path gain
6) Non-touching loops.

SECTION – II

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

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

   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.

SLR-EP – 133

Seat No.	

Set **P**

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) $Ri_f = Ri(1 + AB)$ 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) $1/2\pi R_fC_1$ b) $1/2\pi R_1C_1$
   c) $1/2\pi R_1C_f$ d) $1/2\pi R_fC_f$

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 of CMRR of IC741 ?
   a) 500 nA b) 6 mV c) 90 d) 90 dB

6) Which of the following circuit is used as Diode match finder circuit ?
   a) Voltage follower b) Inverter
   c) Current series feedback amplifier d) None

7) Which of the following is important in deciding the gain of the op-amp ?
   a) DIUO b) DIBO
   c) Level shifting stage d) Output stage

8) Which of the below application can be realized in open loop configuration of Op-amp ?
   a) Schmitt trigger b) Peak Detector
   c) Zero Crossing Detector d) None

9) A duty cycle is _____ in saw tooth wave generator.
   a) 90% b) 66%
   c) Other than 50% d) 20%

10) Analog multiplier are available as
   a) One quadrant b) Two quadrant
   c) Four quadrant d) All of the above

11) IC 8038 is used to generate
   a) Sine wave b) Square wave
   c) Triangular wave d) All of the above

12) Schmitt trigger circuit is also called as
   a) Square wave generator b) Squaring circuit
   c) Sine wave generator d) None of these

13) Butterworth filter is also known as _____ filter.
   a) Flat-flat b) Ripple-flat
   c) Flat-ripple d) Ripple-ripple

14) Which one is sinusoidal oscillator ?
   a) Wein bridge b) Phase shift
   c) Quadrature d) All of the above

_____

SLR-EP – 133

Seat No.	

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

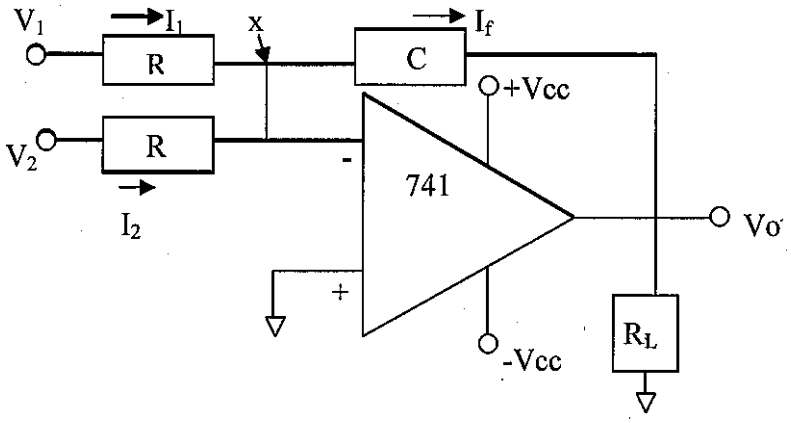
Day and Date : Thursday, 24-11-2016 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Solve **any four** : **(4×4=16)**
   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** : **(6×2=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

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.

SLR-EP – 133

Seat No.	

Set **Q**

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) Which of the below application can be realized in open loop configuration of Op-amp ?
   a) Schmitt trigger b) Peak Detector
   c) Zero Crossing Detector d) None

2) A duty cycle is _____ in saw tooth 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 generate
   a) Sine wave b) Square wave
   c) Triangular wave d) All of the above

5) Schmitt trigger circuit is also called as
   a) Square wave generator b) Squaring circuit
   c) Sine wave generator d) None of these

P.T.O.

6) Butterworth filter is also known as _____ filter.
   a) Flat-flat b) Ripple-flat
   c) Flat-ripple d) Ripple-ripple

7) Which one is sinusoidal oscillator ?
   a) Wein bridge b) Phase shift
   c) Quadrature d) All of the above

8) $Ri_f = Ri(1 + AB)$ represents
   a) Input resistance of non-inverting amplifier
   b) Input resistance of inverting amplifier
   c) Open loop i/p resistance
   d) None of these

9) $A(R_1 + R_f)/(R_1 + R_f + AR_1)$ 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

10) Gain limiting frequency of a differentiator is given by
   a) $1/2\pi R_fC_1$ b) $1/2\pi R_1C_1$
   c) $1/2\pi R_1C_f$ d) $1/2\pi R_fC_f$

11) Slew rate of op-amp is considered for
   a) AC application b) DC application
   c) Both a) and b) d) None

12) What is the value of CMRR of IC741 ?
   a) 500 nA b) 6 mV c) 90 d) 90 dB

13) Which of the following circuit is used as Diode match finder circuit ?
   a) Voltage follower b) Inverter
   c) Current series feedback amplifier d) None

14) Which of the following is important in deciding the gain of the op-amp ?
   a) DIUO b) DIBO
   c) Level shifting stage d) Output stage

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SLR-EP – 133

Seat No.	

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

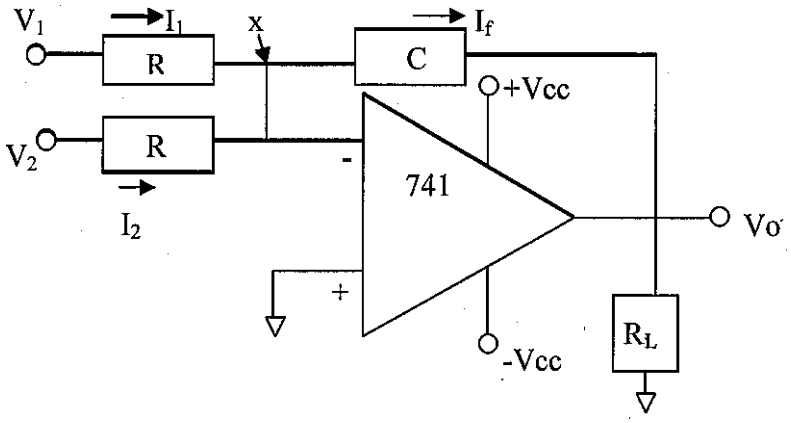
Day and Date : Thursday, 24-11-2016 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Solve **any four** : **(4×4=16)**
   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** : **(6×2=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

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

Seat No.	

Set **R**

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) What is the value of CMRR of IC741 ?
a) 500 nA b) 6 mV c) 90 d) 90 dB

2) Which of the following circuit is used as Diode match finder circuit ?
a) Voltage follower b) Inverter
c) Current series feedback amplifier d) None

3) Which of the following is important in deciding the gain of the op-amp ?
a) DIUO b) DIBO
c) Level shifting stage d) Output stage

4) Which of the below application can be realized in open loop configuration of Op-amp ?
a) Schmitt trigger b) Peak Detector
c) Zero Crossing Detector d) None

5) A duty cycle is _____ in saw tooth wave generator.
a) 90% b) 66%
c) Other than 50% d) 20%

P.T.O.

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 as
   a) Square wave generator
   b) Squaring circuit
   c) Sine wave generator
   d) None of these

9) Butterworth filter is also known as _____ filter.
   a) Flat-flat
   b) Ripple-flat
   c) Flat-ripple
   d) 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
   a) Input resistance of non-inverting amplifier
   b) Input resistance of inverting amplifier
   c) Open loop i/p resistance
   d) None of these

12) $A(R_1 + R_f)/(R_1 + R_f + AR_1)$ 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

13) Gain limiting frequency of a differentiator is given by
   a) $1/2\pi R_f C_1$
   b) $1/2\pi R_1 C_1$
   c) $1/2\pi R_1 C_f$
   d) $1/2\pi R_f C_f$

14) Slew rate of op-amp is considered for
   a) AC application
   b) DC application
   c) Both a) and b)
   d) None

_____

SLR-EP – 133

Seat No.	

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

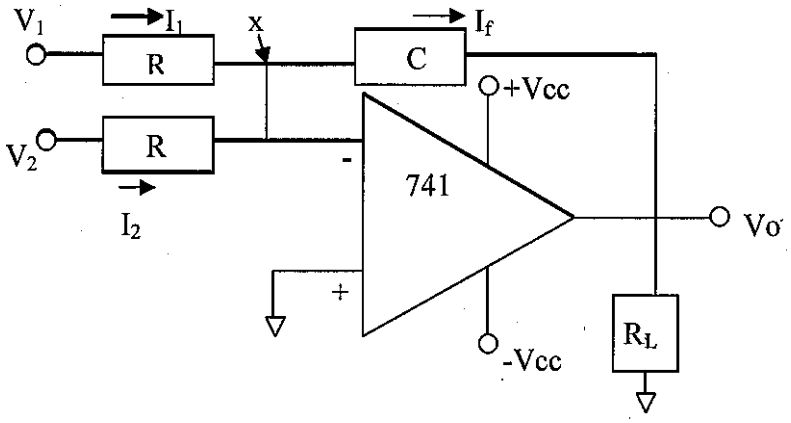
Day and Date : Thursday, 24-11-2016 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Solve **any four** : **(4×4=16)**
   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** : **(6×2=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

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.

SLR-EP – 133

Seat No.	

Set **S**

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) $Ri_f = Ri(1 + AB)$ represents
   a) Input resistance of non-inverting amplifier
   b) Input resistance of inverting amplifier
   c) Open loop i/p resistance
   d) None of these

7) $A(R_1 + R_f)/(R_1 + R_f + AR_1)$ 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

8) Gain limiting frequency of a differentiator is given by
   a) $1/2\pi R_fC_1$ b) $1/2\pi R_1C_1$
   c) $1/2\pi R_1C_f$ d) $1/2\pi R_fC_f$

9) Slew rate of op-amp is considered for
   a) AC application b) DC application
   c) Both a) and b) d) None

10) What is the value of CMRR of IC741 ?
   a) 500 nA b) 6 mV c) 90 d) 90 dB

11) Which of the following circuit is used as Diode match finder circuit ?
   a) Voltage follower b) Inverter
   c) Current series feedback amplifier d) None

12) Which of the following is important in deciding the gain of the op-amp ?
   a) DIUO b) DIBO
   c) Level shifting stage d) Output stage

13) Which of the below application can be realized in open loop configuration of Op-amp ?
   a) Schmitt trigger b) Peak Detector
   c) Zero Crossing Detector d) None

14) A duty cycle is _____ in saw tooth wave generator.
   a) 90% b) 66%
   c) Other than 50% d) 20%

_____

SLR-EP – 133

Seat No.	

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

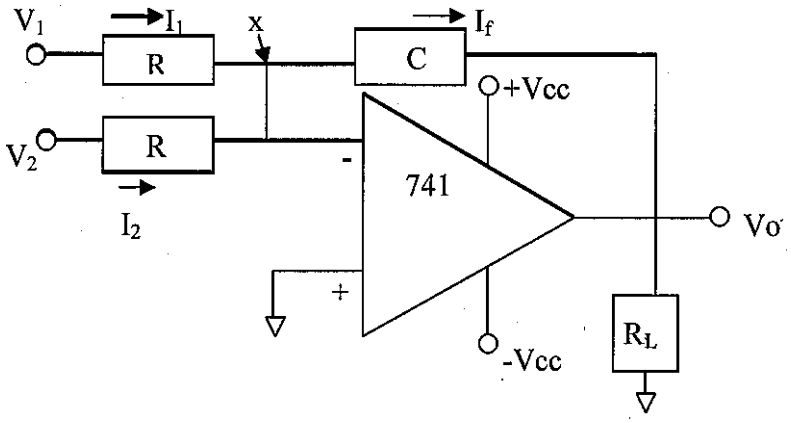
Day and Date : Thursday, 24-11-2016 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Solve **any four** : **(4×4=16)**
   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** : **(6×2=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

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.

SLR-EP – 134

Seat No.	

Set **P**

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 : **(1×14=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) $x_e(t) \cdot x_0(t)$

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 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}

6) Find the time period of x(t) = cos(50t)
   a) 25π b) 50 c) $\pi/2$ d) $\pi/25$

7) 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

8) For x(n) = – u(– n – 1); then ROC is
   a) /z/>1 b) /z/<1 c) /z/>0 d) /z/<0

9) 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

10) 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

11) 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

12) 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

13) Z transform reduces to Fourier transform when it is evaluated on
   a) A half circle b) Z circle
   c) Unit circle d) Imaginary circle

14) If x(n) exists only for $-4 < n \leq 4$ then it is called as _____ sequence.
   a) Bilateral b) Unilateral
   c) Both a) and b) d) None

_____

SLR-EP – 134

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.*

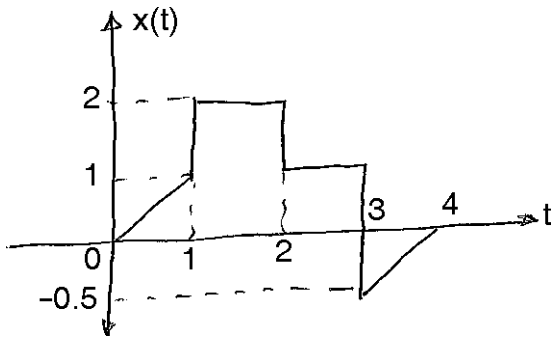
SECTION – I

2. Answer **any three** : **(3×4=12)**

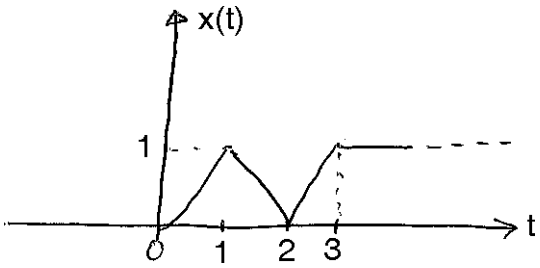
1) Sketch the following signal.

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

$$\frac{d^2y(t)}{dt^2} - \frac{dy(t)}{dt} - 2y(t) = x(t) + \frac{d^2x(t)}{dt^2}.$$

4) Check for Linear or non linear and causal or non causal $y(t) = e^{x(t)}$.

3. Answer **any two** : **(2×8=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** : **(3×4=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 $(n) = a^n . u(n)$.

4) Obtain Fourier transform of $(t) = e^{at} . u(t)$.

5. Attempt **any two** : **(2×8=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.

Set P

SLR-EP – 134

Seat No.	

Set Q

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 : **(1×14=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

P.T.O.

5) 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

6) Z transform reduces to Fourier transform when it is evaluated on
   a) A half circle
   b) Z circle
   c) Unit circle
   d) Imaginary circle

7) If x(n) exists only for $-4 < n \leq 4$ then it is called as _____ sequence.
   a) Bilateral
   b) Unilateral
   c) Both a) and b)
   d) None

8) 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) $y(t) = x(t - 1) + c$

9) 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) $x(t) = \sin^2(t)$

10) 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) $x_e(t) \cdot x_0(t)$

11) 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) $\int_{-\infty}^{\infty} |h(\tau)|\, d\tau = 1$

12) 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}

13) Find the time period of x(t) = cos(50t)
   a) 25π b) 50 c) $\pi/2$ d) $\pi/25$

14) 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

_____

SLR-EP – 134

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.*

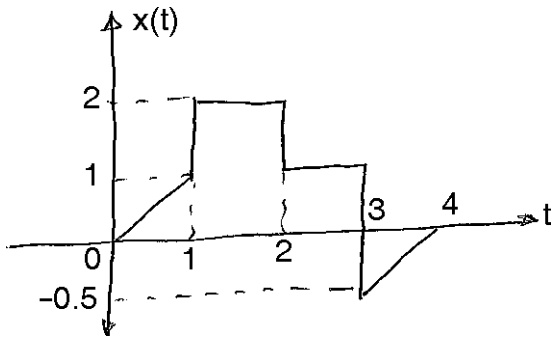
SECTION – I

2. Answer **any three** : **(3×4=12)**

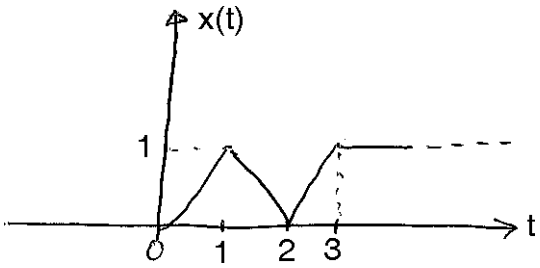
1) Sketch the following signal.

a) x(– t + 3)

b) x(– 2t – 3)



2) Find even and odd component of the following signal.



Set Q

3) Obtain Direct form – I realization for the system described by differential equation

$$\frac{d^2y(t)}{dt^2} - \frac{dy(t)}{dt} - 2y(t) = x(t) + \frac{d^2x(t)}{dt^2}.$$

4) Check for Linear or non linear and causal or non causal $y(t) = e^{x(t)}$.

3. Answer **any two** : **(2×8=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** : **(3×4=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 $(n) = a^n . u(n)$.

4) Obtain Fourier transform of $(t) = e^{at} . u(t)$.

5. Attempt **any two** : **(2×8=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.

Set Q

SLR-EP – 134

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 : **(1×14=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) 25π 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

P.T.O.

6) 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 $-4 < n \leq 4$ 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) $x_e(t) \cdot x_0(t)$

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) $\int_{-\infty}^{\infty} |h(\tau)|\, d\tau = 1$

SLR-EP – 134

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.*

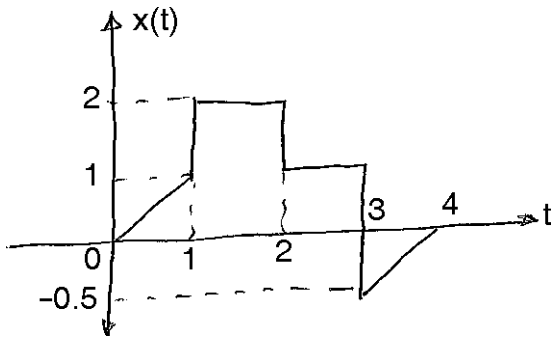
SECTION – I

2. Answer **any three** : **(3×4=12)**

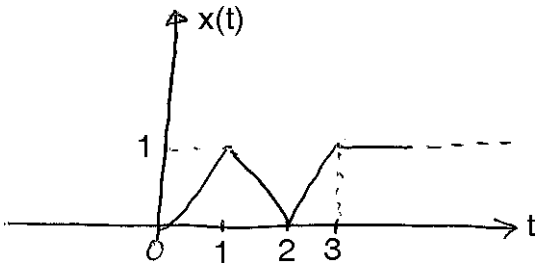
1) Sketch the following signal.

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

$$\frac{d^2y(t)}{dt^2} - \frac{dy(t)}{dt} - 2y(t) = x(t) + \frac{d^2x(t)}{dt^2}.$$

4) Check for Linear or non linear and causal or non causal $y(t) = e^{x(t)}$.

3. Answer **any two** : **(2×8=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** : **(3×4=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 $(n) = a^n . u(n)$.

4) Obtain Fourier transform of $(t) = e^{at} . u(t)$.

5. Attempt **any two** : **(2×8=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.

SLR-EP – 134

Seat 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 **suitable** data if necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer : **(1×14=14)**

1) 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

2) 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

3) 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

4) Z transform reduces to Fourier transform when it is evaluated on
   a) A half circle b) Z circle
   c) Unit circle d) Imaginary circle

5) If x(n) exists only for $-4 < n \leq 4$ then it is called as _____ sequence.
   a) Bilateral b) Unilateral
   c) Both a) and b) d) None

P.T.O.

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) $x_e(t) \cdot x_0(t)$

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) 25π 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
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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

———————

SLR-EP – 134

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.*

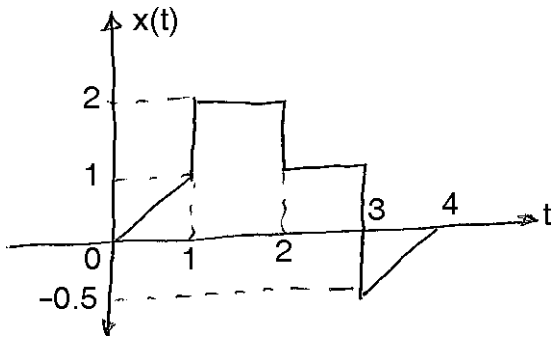
SECTION – I

2. Answer **any three** : **(3×4=12)**

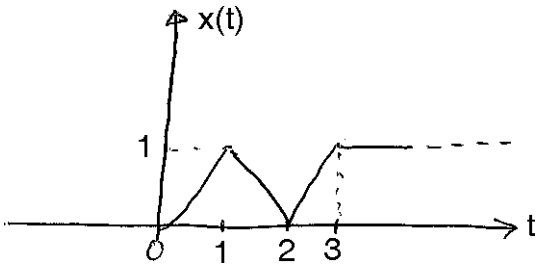
1) Sketch the following signal.

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

$$\frac{d^2y(t)}{dt^2} - \frac{dy(t)}{dt} - 2y(t) = x(t) + \frac{d^2x(t)}{dt^2}.$$

4) Check for Linear or non linear and causal or non causal $y(t) = e^{x(t)}$.

3. Answer **any two** : **(2×8=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** : **(3×4=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 $(n) = a^n . u(n)$.

4) Obtain Fourier transform of $(t) = e^{at} . u(t)$.

5. Attempt **any two** : **(2×8=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.

Set S

SLR-EP – 135

Seat No.	

Set P

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 : **(1×14=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 $\overline{ax}$, the direction of electric field intensity is
   a) $\overline{ay}$ b) $\overline{-ax}$
   c) $\overline{az}$ 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 _____ across a dielectric boundary.
   a) Discontinuous b) Continuous
   c) zero d) ∞

6) The electric field intensity E at a point (1, 2, 2) due to 7 nC located at (0, 0, 0) is
   a) 7 V/m b) 0 V/m
   c) 1/7 V/m d) None of these

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

8) 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

9) Total flux passing through a closed surface held in a magnetic field is
   a) Infinity b) Zero
   c) Unity d) None of these

10) Energy density W_H is given as
   a) Energy per volume b) Energy per area
   c) Linear energy d) 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) $\nabla\bar{E} = Y\bar{E}$ b) $\nabla^2\bar{E} = Y\bar{E}$
   c) $\nabla^2\bar{E} = Y^2\bar{E}$ d) $\nabla\bar{E} = Y^2\bar{E}$

13) The unit of vector magnetic potential is
   a) flux b) volt
   c) v/m d) wb/m

14) $\nabla.\bar{J} = 0$ is frequently known as
   a) Continuity equation for steady currents
   b) Laplace equation
   c) Poisson's equation
   d) None of these

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SLR-EP – 135

Seat No.	

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** : **(3×4=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 $\bar{E} = 0$ 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 $\varepsilon = \varepsilon_0$, find $\bar{E}$, $\bar{D}$, ρv as a function of x.

5) Let $\bar{D} = \left(10r^2 + 5e^{-r}\right)\overline{ar}\ \frac{C}{m^2}$ in spherical co-ordinates. Find volume charge density for r = 1m.

3. Attempt **any two** : **(2×8=16)**

a) Verify Divergence theorem for $\bar{D} = \frac{2}{z^2}\left(yz\,\overline{ax} + xz\,\overline{ay} - 2xy\,\overline{az}\right)$ C/m^3 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 P

SECTION – II

4. Solve **any three** : **(3×4=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 $\bar{H} = H_m e^{j(\omega t + \beta z)} \bar{a}_x$ in free space. Find $\bar{E}$.

   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 β are required of two fields $\bar{E} = 120\pi \cos\left(10^6 \pi t - \beta x\right) \bar{a}_y$ (V/m) and $\bar{H} = A \cos\left(10^6 \pi t - \beta x\right) \bar{a}_z (A/m)$? Satisfy Maxwell's equation in a medium where $\mu_r = \varepsilon_r = 4$ 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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SLR-EP – 135

Seat No.	

Set Q

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 : **(1×14=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) $\nabla\bar{E} = Y\bar{E}$ b) $\nabla^2\bar{E} = Y\bar{E}$
   c) $\nabla^2\bar{E} = Y^2\bar{E}$ d) $\nabla\bar{E} = Y^2\bar{E}$

6) The unit of vector magnetic potential is
   a) flux b) volt
   c) v/m d) wb/m

7) $\nabla.\bar{J} = 0$ is frequently known as
   a) Continuity equation for steady currents
   b) Laplace equation
   c) Poisson's equation
   d) None of these

8) 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

9) If the voltage applied across the capacitor is increased, the capacitance value
   a) increases b) decreases
   c) remains constant d) becomes infinity

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

11) 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

12) The normal components of D are _____ across a dielectric boundary.
   a) Discontinuous b) Continuous
   c) zero d) ∞

13) The electric field intensity E at a point (1, 2, 2) due to 7 nC located at (0, 0, 0) is
   a) 7 V/m b) 0 V/m
   c) 1/7 V/m d) None of these

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

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SLR-EP – 135

Seat No.	

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** : **(3×4=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 $\bar{E} = 0$ 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 $\varepsilon = \varepsilon_0$, find $\bar{E}$, $\bar{D}$, ρv as a function of x.

5) Let $\bar{D} = \left(10r^2 + 5e^{-r}\right)\overline{ar}\ \frac{C}{m^2}$ in spherical co-ordinates. Find volume charge density for r = 1m.

3. Attempt **any two** : **(2×8=16)**

a) Verify Divergence theorem for $\bar{D} = \frac{2}{z^2}\left(yz\,\overline{ax} + xz\,\overline{ay} - 2xy\,\overline{az}\right)$ C/m^3 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 Q

SECTION – II

4. Solve **any three** : **(3×4=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 $\bar{H} = H_m e^{j(\omega t + \beta z)} \bar{a}_x$ in free space. Find $\bar{E}$.

   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 β are required of two fields $\bar{E} = 120\pi \cos\left(10^6 \pi t - \beta x\right) \bar{a}_y$ (V/m) and $\bar{H} = A \cos\left(10^6 \pi t - \beta x\right) \bar{a}_z (A/m)$? Satisfy Maxwell's equation in a medium where $\mu_r = \varepsilon_r = 4$ 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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SLR-EP – 135

Seat No.	

Set R

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 : **(1×14=14)**

1) The normal components of D are _____ across a dielectric boundary.
   a) Discontinuous b) Continuous
   c) zero d) ∞

2) The electric field intensity E at a point (1, 2, 2) due to 7 nC located at (0, 0, 0) is
   a) 7 V/m 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 b) Area and its direction
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5) Total flux passing through a closed surface held in a magnetic field is
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6) Energy density W_H is given as
   a) Energy per volume
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7) A Loop antenna may be of
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   b) Hexagonal shape
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   d) Any of the above

8) The wave equation is
   a) $\nabla\bar{E} = Y\bar{E}$
   b) $\nabla^2\bar{E} = Y\bar{E}$
   c) $\nabla^2\bar{E} = Y^2\bar{E}$
   d) $\nabla\bar{E} = Y^2\bar{E}$

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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SLR-EP – 135

Seat No.	

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** : **(3×4=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 $\bar{E} = 0$ 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 $\varepsilon = \varepsilon_0$, find $\bar{E}$, $\bar{D}$, ρv as a function of x.

5) Let $\bar{D} = \left(10r^2 + 5e^{-r}\right)\overline{ar}\ \frac{C}{m^2}$ in spherical co-ordinates. Find volume charge density for r = 1m.

3. Attempt **any two** : **(2×8=16)**

a) Verify Divergence theorem for $\bar{D} = \frac{2}{z^2}\left(yz\,\overline{ax} + xz\,\overline{ay} - 2xy\,\overline{az}\right)$ C/m^3 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

SECTION – II

4. Solve **any three** : **(3×4=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 $\bar{H} = H_m e^{j(\omega t + \beta z)} \bar{a}_x$ in free space. Find $\bar{E}$.

   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 β are required of two fields $\bar{E} = 120\pi \cos\left(10^6 \pi t - \beta x\right) \bar{a}_y$ (V/m) and $\bar{H} = A \cos\left(10^6 \pi t - \beta x\right) \bar{a}_z (A/m)$? Satisfy Maxwell's equation in a medium where $\mu_r = \varepsilon_r = 4$ 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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SLR-EP – 135

Seat No.	

Set S

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 : **(1×14=14)**

1) Energy density W_H is given as
   a) Energy per volume
   b) Energy per area
   c) Linear energy
   d) All of these

2) A Loop antenna may be of
   a) Square on triangular shape
   b) Hexagonal shape
   c) Circular shape
   d) Any of the above

3) The wave equation is
   a) $\nabla\bar{E} = Y\bar{E}$
   b) $\nabla^2\bar{E} = Y\bar{E}$
   c) $\nabla^2\bar{E} = Y^2\bar{E}$
   d) $\nabla\bar{E} = Y^2\bar{E}$

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

P.T.O.

6) 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

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

8) 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) $\overline{ax}$

9) 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

10) The normal components of D are _____ across a dielectric boundary.
   a) Discontinuous
   b) Continuous
   c) zero
   d) ∞

11) The electric field intensity E at a point (1, 2, 2) due to 7 nC located at (0, 0, 0) is
   a) 7 V/m
   b) 0 V/m
   c) 1/7 V/m
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12) Which of the following is meaningless combination ?
   a) grad div
   b) curl div
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   d) none of these

13) Magnetic flux density is a relation of
   a) Current and area
   b) Area and its direction
   c) Magnetic flux and area
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14) Total flux passing through a closed surface held in a magnetic field is
   a) Infinity
   b) Zero
   c) Unity
   d) None of these

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SLR-EP – 135

Seat No.	

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** : **(3×4=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 $\bar{E} = 0$ 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 $\varepsilon = \varepsilon_0$, find $\bar{E}$, $\bar{D}$, ρv as a function of x.

5) Let $\bar{D} = \left(10r^2 + 5e^{-r}\right)\overline{ar}\ \frac{C}{m^2}$ in spherical co-ordinates. Find volume charge density for r = 1m.

3. Attempt **any two** : **(2×8=16)**

a) Verify Divergence theorem for $\bar{D} = \frac{2}{z^2}\left(yz\,\overline{ax} + xz\,\overline{ay} - 2xy\,\overline{az}\right)$ C/m^3 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 S

SECTION – II

4. Solve **any three** : **(3×4=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
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   4) Given that $\bar{H} = H_m e^{j(\omega t + \beta z)} \bar{a}_x$ in free space. Find $\bar{E}$.

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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 β are required of two fields $\bar{E} = 120\pi \cos\left(10^6 \pi t - \beta x\right) \bar{a}_y$ (V/m) and $\bar{H} = A \cos\left(10^6 \pi t - \beta x\right) \bar{a}_z (A/m)$? Satisfy Maxwell's equation in a medium where $\mu_r = \varepsilon_r = 4$ 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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SLR-EP – 136

Seat No.	

Set P

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

6) In an eye pattern opening of eye indicates
   a) ISI increases
   b) ISI decreases
   c) Timing jitter increases
   d) Timing jitter decreases

7) Which encoding method uses alternating positive and negative 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 the input signal is _____ and transmitted signal is
   a) analog, analog
   b) digital, analog
   c) digital, digital
   d) analog, digital

10) In a QAM both identities are varied
   a) amplitude and phase
   b) frequency and phase
   c) bit rate and phase
   d) baud rate and phase

11) 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 system application, the receiver designed is an optimum coherent receiver, the channel noise is white and bits are transmitted using rectangular pulses then which one of the following statement would be inconsistent ? The receiver is
   a) a correlation receiver
   b) matched filter receiver
   c) an integrate and dump receiver
   d) sample, hold and dump receiver

13) Costas loop is a method for
   a) Frame synchronization
   b) Carrier synchronization
   c) Symbol synchronization
   d) None of these

14) Multichannel signal transmission is commonly used on time varying channels to overcome the effects of
   a) attenuation
   b) amplification
   c) phase shift
   d) signal fading

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SLR-EP – 136

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 : **(4×4=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 : **(2×6=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 0.2 0.12 0.08 0.08 0.081 0.04]

c) Briefly explain the function of Scrambler and Unscrambler.

SECTION – II **28**

4. Answer **any four** of the following : **(4×4=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 : **(2×6=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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SLR-EP – 136

Seat No.	

Set Q

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) _____ most affected by noise.
a) PSK b) ASK c) FSK d) DPSK

2) In a continuous wave modulation scheme the input signal is _____ and transmitted signal is
a) analog, analog b) digital, analog
c) digital, digital d) analog, digital

3) In a QAM both identities are varied
a) amplitude and phase b) frequency and phase
c) bit rate and phase d) baud rate and phase

4) The noise immunity of 16 QASK is _____ than 16 PSK.
a) Less b) High c) Equal d) None

5) If in a particular digital communication system application, the receiver designed is an optimum coherent receiver, the channel noise is white and bits are transmitted using rectangular pulses then which one of the following statement would be inconsistent ? The receiver is
a) a correlation receiver b) matched filter receiver
c) an integrate and dump receiver d) sample, hold and dump receiver

6) Costas loop is a method for
a) Frame synchronization b) Carrier synchronization
c) Symbol synchronization d) None of these

P.T.O.

7) Multichannel signal transmission is commonly used on time varying channels to overcome the effects of
   a) attenuation b) amplification
   c) phase shift d) signal fading

8) 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

9) 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

10) 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

11) 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

12) 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

13) In an eye pattern opening of eye indicates
   a) ISI increases b) ISI decreases
   c) Timing jitter increases d) Timing jitter decreases

14) Which encoding method uses alternating positive and negative values for 1's ?
   a) NRZ-1 b) RZ c) Manchester d) AMI

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SLR-EP – 136

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 : **(4×4=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 : **(2×6=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.

$[X] = [x1 \quad x2 \quad x3 \quad x4 \quad x5 \quad x6 \quad x7]$

$[P] = [0.4 \quad 0.2 \quad 0.12 \quad 0.08 \quad 0.08 \quad 0.081 \quad 0.04]$

c) Briefly explain the function of Scrambler and Unscrambler.

SECTION – II **28**

4. Answer **any four** of the following : **(4×4=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 : **(2×6=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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SLR-EP – 136

Seat No.	

Set R

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 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) In an eye pattern opening of eye indicates
   a) ISI increases b) ISI decreases
   c) Timing jitter increases d) Timing jitter decreases

3) Which encoding method uses alternating positive and negative values for 1's ?
   a) NRZ-1 b) RZ c) Manchester d) AMI

4) _____ most affected by noise.
   a) PSK b) ASK c) FSK d) DPSK

5) In a continuous wave modulation scheme the input signal is _____ and transmitted signal is
   a) analog, analog b) digital, analog
   c) digital, digital d) analog, digital

6) In a QAM both identities are varied
   a) amplitude and phase b) frequency and phase
   c) bit rate and phase d) baud rate and phase

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 system application, the receiver designed is an optimum coherent receiver, the channel noise is white and bits are transmitted using rectangular pulses then which one of the following statement would be inconsistent ? The receiver is
   a) a correlation receiver
   b) matched filter receiver
   c) an integrate and dump receiver
   d) sample, hold and dump receiver

9) Costas loop is a method for
   a) Frame synchronization
   b) Carrier synchronization
   c) Symbol synchronization
   d) None of these

10) Multichannel signal transmission is commonly used on time varying channels to overcome the effects of
   a) attenuation
   b) amplification
   c) phase shift
   d) signal fading

11) 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

12) 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
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13) 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

14) 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

SLR-EP – 136

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 : **(4×4=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 : **(2×6=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.

$[X] = [x1 \quad x2 \quad x3 \quad x4 \quad x5 \quad x6 \quad x7]$

$[P] = [0.4 \quad 0.2 \quad 0.12 \quad 0.08 \quad 0.08 \quad 0.081 \quad 0.04]$

c) Briefly explain the function of Scrambler and Unscrambler.

SECTION – II **28**

4. Answer **any four** of the following : **(4×4=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 : **(2×6=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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SLR-EP – 136

Seat No.	

Set S

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) In a QAM both identities are varied
   a) amplitude and phase b) frequency and phase
   c) bit rate and phase d) baud rate and phase

2) The noise immunity of 16 QASK is _____ than 16 PSK.
   a) Less b) High c) Equal d) None

3) If in a particular digital communication system application, the receiver designed is an optimum coherent receiver, the channel noise is white and bits are transmitted using rectangular pulses then which one of the following statement would be inconsistent ? The receiver is
   a) a correlation receiver b) matched filter receiver
   c) an integrate and dump receiver d) sample, hold and dump receiver

4) Costas loop is a method for
   a) Frame synchronization b) Carrier synchronization
   c) Symbol synchronization d) None of these

5) Multichannel signal transmission is commonly used on time varying channels to overcome the effects of
   a) attenuation b) amplification
   c) phase shift d) signal fading

6) 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

7) The baud rate when using binary transmission is
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   c) a sample and hold circuit
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9) 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

10) The quantizer in the PCM transmitter is used for
   a) converting analog signal into N bit digital word
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   d) none of the above

11) In an eye pattern opening of eye indicates
   a) ISI increases
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   c) Timing jitter increases
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12) Which encoding method uses alternating positive and negative values for 1's ?
   a) NRZ-1 b) RZ c) Manchester d) AMI

13) _____ most affected by noise.
   a) PSK b) ASK c) FSK d) DPSK

14) In a continuous wave modulation scheme the input signal is _____ and transmitted signal is
   a) analog, analog
   b) digital, analog
   c) digital, digital
   d) analog, digital

SLR-EP – 136

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 : **(4×4=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 : **(2×6=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 0.2 0.12 0.08 0.08 0.081 0.04]

c) Briefly explain the function of Scrambler and Unscrambler.

SECTION – II **28**

4. Answer **any four** of the following : **(4×4=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 : **(2×6=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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SLR-EP – 137

Seat No.	

Set **P**

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 : **(14×1=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

P.T.O.

6) Requirement document is prepared with respect to
   a) Manager b) Customer
   c) System test engineer d) All of the above

7) The fundamental notions of software engineering does not account for
   a) Software processes b) Software security
   c) Software reuse d) Software validation

8) The base line budget is based on
   a) Activity network b) Cost monitoring
   c) Proposed plan d) None

9) In an activity on arrow network, which of below have duration ?
   a) Link b) Loop c) Node d) All

10) _____ is carried out to calculate the latest dates on which each activity may be started and completed.
   a) Backward pass b) Forward pass c) End pass d) None

11) 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

12) In network model formulation hammock activities required
   a) Full b) Half c) Zero d) One and half

13) From program management where a portfolio of all project contribute to a common objective
   a) Strategic programme b) Business cycle
   c) Innovative d) R & D

14) One of the objectives of activity planning is
   a) Planning b) Estimation c) Co-ordination d) None

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SLR-EP – 137

Seat No.	

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** : **(3×4=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** : **(8×2=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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Set P

Set P

SLR-EP – 137

Seat No.	

Set **Q**

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.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer : **(14×1=14)**

1) The base line budget is based on
   a) Activity network b) Cost monitoring
   c) Proposed plan d) None

2) In an activity on arrow network, which of below have duration ?
   a) Link b) Loop c) Node d) All

3) _____ is carried out to calculate the latest dates on which each activity may be started and completed.
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   a) Tracking project progress
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5) In network model formulation hammock activities required
   a) Full b) Half c) Zero d) One and half

6) From program management where a portfolio of all project contribute to a common objective
   a) Strategic programme b) Business cycle
   c) Innovative d) R & D

7) One of the objectives of activity planning is
   a) Planning b) Estimation c) Co-ordination d) None
8) Component testing is a responsibility of
   a) System test team b) Component developer
   c) Test manager d) Customer
9) 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
10) Context model is concerned with
   a) System model
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11) "v" model gives stress on
   a) Maintenance of system b) Testing of system
   c) Validation of system d) Both b) and c)
12) Functional requirement includes
   a) I/p to system b) O/p of system
   c) I/p and o/p d) Security of system
13) Requirement document is prepared with respect to
   a) Manager b) Customer
   c) System test engineer d) All of the above
14) The fundamental notions of software engineering does not account for
   a) Software processes b) Software security
   c) Software reuse d) Software validation

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SLR-EP – 137

Seat No.	

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** : **(3×4=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** : **(8×2=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.
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   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.
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_____

Set Q

Set Q

SLR-EP – 137

Seat No.	

Set R

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.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer : **(14×1=14)**

1) Functional requirement includes
   a) I/p to system b) O/p of system
   c) I/p and o/p d) Security of system

2) Requirement document is prepared with respect to
   a) Manager b) Customer
   c) System test engineer d) All of the above

3) The fundamental notions of software engineering does not account for
   a) Software processes b) Software security
   c) Software reuse d) Software validation

4) The base line budget is based on
   a) Activity network b) Cost monitoring
   c) Proposed plan d) None

5) In an activity on arrow network, which of below have duration ?
   a) Link b) Loop c) Node d) All

6) _____ is carried out to calculate the latest dates on which each activity may be started and completed.
   a) Backward pass b) Forward pass c) End pass d) None

P.T.O.

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 hammock activities required
   a) Full b) Half c) Zero d) One and half

9) From program management where a portfolio of all project contribute to a common objective
   a) Strategic programme b) Business cycle
   c) Innovative d) R & D

10) One of the objectives of activity planning is
   a) Planning b) Estimation c) Co-ordination d) None

11) Component testing is a responsibility of
   a) System test team b) Component developer
   c) Test manager 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
   a) System model
   b) Arrangement of elements around some entity
   c) Process model
   d) All of the above

14) "v" model gives stress on
   a) Maintenance of system b) Testing of system
   c) Validation of system d) Both b) and c)

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SLR-EP – 137

Seat No.	

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** : **(3×4=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** : **(8×2=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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Set R

Set R

SLR-EP – 137

Seat No.	

Set **S**

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 : **(14×1=14)**

1) _____ is carried out to calculate the latest dates on which each activity may be started and completed.
a) Backward pass b) Forward pass c) End pass d) None

2) 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

3) In network model formulation hammock activities required
a) Full b) Half c) Zero d) One and half

4) From program management where a portfolio of all project contribute to a common objective
a) Strategic programme b) Business cycle
c) Innovative d) R & D

5) One of the objectives of activity planning is
a) Planning b) Estimation c) Co-ordination d) None

6) Component testing is a responsibility of
a) System test team b) Component developer
c) Test manager d) Customer

7) 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

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 stress on
   a) Maintenance of system
   b) Testing of system
   c) Validation of system
   d) Both b) and c)

10) Functional requirement includes
   a) I/p to system
   b) O/p of system
   c) I/p and o/p
   d) Security of system

11) Requirement document is prepared with respect to
   a) Manager
   b) Customer
   c) System test engineer
   d) All of the above

12) The fundamental notions of software engineering does not account for
   a) Software processes
   b) Software security
   c) Software reuse
   d) Software validation

13) The base line budget is based on
   a) Activity network
   b) Cost monitoring
   c) Proposed plan
   d) None

14) In an activity on arrow network, which of below have duration ?
   a) Link b) Loop c) Node d) All

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SLR-EP – 137

Seat No.	

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** : **(3×4=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** : **(8×2=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.

_____

Set S

Set S

SLR-EP – 138

Seat No.	

Set P

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 : **(1×14=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

P.T.O.

6) $W_N^{k+N/2}$ =

a) W_N^{k} b) $-W_N^{k}$

c) W_N^{-k} d) None of the mentioned

7) 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

8) 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

9) 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

10) IIR filter design is based on _____ filter design.

a) Analog b) Discrete time c) Digital d) None

11) For impulse response of FIR filter to satisfy for constant group delay, the phase is given by

a) $\theta(w) = -\alpha w$ b) $\theta(w) = \alpha w$ c) $\theta(w) = \beta - \alpha w$ d) $\theta(w) = 0$

12) 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

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

c) Maximum of (M, N) memory location

d) All of the above

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SLR-EP – 138

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 : **(4×5=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 : **(1×8=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** : **(4×4=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.

Set P

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 $\pi \geq \omega \geq \frac{\pi}{3}$

$= 0$ 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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SLR-EP – 138

Seat No.	

Set Q

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 : **(1×14=14)**

1) 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

2) 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

3) IIR filter design is based on _____ filter design.
   a) Analog b) Discrete time c) Digital d) None

4) For impulse response of FIR filter to satisfy for constant group delay, the phase is given by
   a) $\theta(w) = -\alpha w$ b) $\theta(w) = \alpha w$ c) $\theta(w) = \beta - \alpha w$ d) $\theta(w) = 0$

5) 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

6) The advantage of cascade realization is
   a) Quantization error can be minimized
   b) Noise decreased
   c) Linear Phase
   d) None

P.T.O.

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^2 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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SLR-EP – 138

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 : **(4×5=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 : **(1×8=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** : **(4×4=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.

Set Q

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 $\pi \geq \omega \geq \frac{\pi}{3}$

$= 0$ 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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SLR-EP – 138

Seat No.	

Set R

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 : **(1×14=14)**

1) 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

2) $W_N^{k+N/2}$ =
   a) W_N^k b) $-W_N^k$
   c) W_N^{-k} d) None of the mentioned

3) 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

4) 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

5) 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

6) IIR filter design is based on _____ filter design.
   a) Analog b) Discrete time c) Digital d) None

P.T.O.

7) For impulse response of FIR filter to satisfy for constant group delay, the phase is given by

a) $\theta(w) = -\alpha w$ 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

SLR-EP – 138

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 : **(4×5=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 : **(1×8=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** : **(4×4=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.

Set R

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 $\pi \geq \omega \geq \frac{\pi}{3}$

$= 0$ 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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SLR-EP – 138

Seat No.	

Set S

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 : **(1×14=14)**

1) IIR filter design is based on _____ filter design.
a) Analog b) Discrete time c) Digital d) None

2) For impulse response of FIR filter to satisfy for constant group delay, the phase is given by
a) $\theta(w) = -\alpha w$ b) $\theta(w) = \alpha w$ c) $\theta(w) = \beta - \alpha w$ d) $\theta(w) = 0$

3) 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

4) The advantage of cascade realization is
a) Quantization error can be minimized
b) Noise decreased
c) Linear Phase
d) None

5) 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

6) 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

P.T.O.

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^2 complex multiplications and N(N + 1) complex additions
   d) N^2 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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SLR-EP – 138

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 : **(4×5=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 : **(1×8=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** : **(4×4=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.

Set S

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 $\pi \geq \omega \geq \frac{\pi}{3}$

$= 0$ 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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SLR-EP – 139

Seat No.	

Set P

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 queue 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

P.T.O.

6) For generating square wave with period 1 ms, the BCD count value required to load in counter of 8253, for 1 MHz input frequency is
   a) $(500)_{10}$ b) $(800)_{10}$ c) $(900)_{10}$ d) $(1000)_{10}$

7) The 8253 counter starts counting only if
   a) GATE signal is low b) GATE signal is high
   c) CLK signal is low d) CLK signal is high

8) 8251 is a
   a) UART
   b) USART
   c) Programmable Interrupt controller
   d) Programmable interval timer/counter

9) Which pins are general purpose I/O pins during mode-2 operation of the 8255 ?
   a) PA0-PA7 b) PB0-PB7
   c) PC4-PC7 d) PC0-PC3

10) ADC 0809 is of _____ type.
   a) Weighted register b) Successive approximation
   c) R-2R ladder d) Dual slope

11) Control word format required to initialize 8251 in asynchronous mode for baud rate factor 1x, character length 5 bits, no parity, 1 stop bit is
   a) 41 H b) 51 H c) 50 H d) 40 H

12) The number of flags present in 8086 are
   a) 5 b) 8 c) 9 d) 13

13) Tick mark the odd instruction from the given
   a) XCHG b) RAL c) DAA d) ADD B

14) Microprocessor enter into wait state when
   a) Any interrupt signal applied b) Low signal on READY pin
   c) High signal on READY pin d) None of these

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SLR-EP – 139

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 $\overline{MEMR}$, $\overline{MEMW}$, $\overline{IOR}$ and $\overline{IOW}$ by using the 3 : 8 decoder (74138). **4**

3. Solve **any two** : **14**
   1) Interface 2K × 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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SLR-EP – 139

Seat No.	

Set Q

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) 8251 is a
   a) UART
   b) USART
   c) Programmable Interrupt controller
   d) Programmable interval timer/counter

2) Which pins are general purpose I/O pins during mode-2 operation of the 8255 ?
   a) PA0-PA7 b) PB0-PB7
   c) PC4-PC7 d) PC0-PC3

3) ADC 0809 is of _____ type.
   a) Weighted register b) Successive approximation
   c) R-2R ladder d) Dual slope

4) Control word format required to initialize 8251 in asynchronous mode for baud rate factor 1x, character length 5 bits, no parity, 1 stop bit is
   a) 41 H b) 51 H c) 50 H d) 40 H

P.T.O.

5) The number of flags present in 8086 are
   a) 5 b) 8 c) 9 d) 13

6) Tick mark the odd instruction from the given
   a) XCHG b) RAL c) DAA d) ADD B

7) Microprocessor enter into wait state when
   a) Any interrupt signal applied b) Low signal on READY pin
   c) High signal on READY pin d) None of these

8) 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

9) In memory mapped I/O; address width is
   a) 8 bit b) 32 bit c) 16 bit d) 64 bit

10) RST 7.5 interrupt is
   a) Level triggered b) +ve edge triggered
   c) –ve edge triggered d) Both a) and b)

11) The length of the instruction queue in 8086 is
   a) 4 byte b) 5 byte c) 6 byte d) 8 byte

12) If all the ports of 8255 used in output mode then the command word is
   a) 80H b) 90H c) A0H d) B0H

13) For generating square wave with period 1 ms, the BCD count value required to load in counter of 8253, for 1 MHz input frequency is
   a) $(500)_{10}$ b) $(800)_{10}$ c) $(900)_{10}$ d) $(1000)_{10}$

14) The 8253 counter starts counting only if
   a) GATE signal is low b) GATE signal is high
   c) CLK signal is low d) CLK signal is high

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SLR-EP – 139

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 $\overline{MEMR}$, $\overline{MEMW}$, $\overline{IOR}$ and $\overline{IOW}$ by using the 3 : 8 decoder (74138). **4**

3. Solve **any two** : **14**
   1) Interface 2K × 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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SLR-EP – 139

Seat No.	

Set R

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) If all the ports of 8255 used in output mode then the command word is
   a) 80H b) 90H c) A0H d) B0H

2) For generating square wave with period 1 ms, the BCD count value required to load in counter of 8253, for 1 MHz input frequency is
   a) $(500)_{10}$ b) $(800)_{10}$ c) $(900)_{10}$ d) $(1000)_{10}$

3) The 8253 counter starts counting only if
   a) GATE signal is low b) GATE signal is high
   c) CLK signal is low d) CLK signal is high

4) 8251 is a
   a) UART
   b) USART
   c) Programmable Interrupt controller
   d) Programmable interval timer/counter

5) Which pins are general purpose I/O pins during mode-2 operation of the 8255 ?
   a) PA0-PA7 b) PB0-PB7
   c) PC4-PC7 d) PC0-PC3

6) ADC 0809 is of _____ type.
   a) Weighted register b) Successive approximation
   c) R-2R ladder d) Dual slope

7) Control word format required to initialize 8251 in asynchronous mode for baud rate factor 1x, character length 5 bits, no parity, 1 stop bit is
   a) 41 H b) 51 H c) 50 H d) 40 H

8) The number of flags present in 8086 are
   a) 5 b) 8 c) 9 d) 13

9) Tick mark the odd instruction from the given
   a) XCHG b) RAL c) DAA d) ADD B

10) Microprocessor enter into wait state when
   a) Any interrupt signal applied b) Low signal on READY pin
   c) High signal on READY pin d) None of these

11) 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

12) In memory mapped I/O; address width is
   a) 8 bit b) 32 bit c) 16 bit d) 64 bit

13) RST 7.5 interrupt is
   a) Level triggered b) +ve edge triggered
   c) –ve edge triggered d) Both a) and b)

14) The length of the instruction queue in 8086 is
   a) 4 byte b) 5 byte c) 6 byte d) 8 byte

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SLR-EP – 139

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**.*
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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 $\overline{MEMR}$, $\overline{MEMW}$, $\overline{IOR}$ and $\overline{IOW}$ by using the 3 : 8 decoder (74138). **4**

3. Solve **any two** : **14**
   1) Interface 2K × 8 EPROM memory to 8085. Give its initial and final address.
   2) Explain the hardware interrupts of 8085.
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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.

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SLR-EP – 139

Seat No.	

Set S

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) ADC 0809 is of _____ type.
   a) Weighted register b) Successive approximation
   c) R-2R ladder d) Dual slope

2) Control word format required to initialize 8251 in asynchronous mode for baud rate factor 1x, character length 5 bits, no parity, 1 stop bit is
   a) 41 H b) 51 H c) 50 H d) 40 H

3) The number of flags present in 8086 are
   a) 5 b) 8 c) 9 d) 13

4) Tick mark the odd instruction from the given
   a) XCHG b) RAL c) DAA d) ADD B

5) Microprocessor enter into wait state when
   a) Any interrupt signal applied b) Low signal on READY pin
   c) High signal on READY pin d) None of these

6) 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

7) In memory mapped I/O; address width 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 triggered
   c) –ve edge triggered
   d) Both a) and b)

9) The length of the instruction queue in 8086 is
   a) 4 byte
   b) 5 byte
   c) 6 byte
   d) 8 byte

10) If all the ports of 8255 used in output mode then the command word is
   a) 80H
   b) 90H
   c) A0H
   d) B0H

11) For generating square wave with period 1 ms, the BCD count value required to load in counter of 8253, for 1 MHz input frequency is
   a) $(500)_{10}$
   b) $(800)_{10}$
   c) $(900)_{10}$
   d) $(1000)_{10}$

12) The 8253 counter starts counting only if
   a) GATE signal is low
   b) GATE signal is high
   c) CLK signal is low
   d) CLK signal is high

13) 8251 is a
   a) UART
   b) USART
   c) Programmable Interrupt controller
   d) Programmable interval timer/counter

14) Which pins are general purpose I/O pins during mode-2 operation of the 8255 ?
   a) PA0-PA7
   b) PB0-PB7
   c) PC4-PC7
   d) PC0-PC3

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SLR-EP – 139

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 $\overline{MEMR}$, $\overline{MEMW}$, $\overline{IOR}$ and $\overline{IOW}$ by using the 3 : 8 decoder (74138). **4**

3. Solve **any two** : **14**
   1) Interface 2K × 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 S

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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SLR-EP – 141

Seat No.	

Set P

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****.*
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 : 20

1. Choose the correct answer : **(1×20=20)**

1) In E plane Tee, if input is given to auxiliary arm, the output from main arms are
   a) In phase b) 90° out of phase
   c) 180° out of phase d) 270° out of phase

2) An air filled rectangular waveguide of inside dimensions 7 cm × 3.5 cm operates in dominant mode. The cut of frequency is
   a) 2.14 GHz b) 21.4 GHz c) 2.14 MHz d) 21.4 MHz

3) 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

4) The characteristic impedance of transmission line is given as z_0 =
   a) $\sqrt{z/y}$ b) $\sqrt{zy}$ c) $\sqrt{z+y}$ d) $\sqrt{z-y}$

5) The reflection coefficient is generally a complex quantity that can be expressed as $\overline{|i} = |\overline{|i}\,|e^{j\theta i}$. Then θ_i for open circuit is
   a) 180° b) 0° c) 90° d) 270°

6) In rectangular waveguide, lower order modes are not present in
   a) TE b) TM c) TEM d) TE & TM

7) The spacing between the centers of two holes in directional coupler must be
   a) $(n + 1)\lambda/4$ b) $(n + 2)\lambda/4$ c) $(2n + 1)\lambda/4$ d) $n\lambda/4$

P.T.O.

8) A n type GaAS Gunn diode have a length L = 210 μ m with a low field resistance of 16 Ω and applied voltage V = 59 V. Then the threshold electric field is
a) 2810 V/cm b) 2800 V/cm c) 2805 V/cm d) 2815 V/cm

9) In two valley theory, the negative resistance is achieved only when
a) $\Delta E = KT$ b) $\Delta E < KT$ c) $\Delta E > KT$ d) None of these

10) A typical n type GaAS Gunn diode has electron drift velocity of 10^5 m/s with electric field of 2800 V/cm. Then negative electron mobility is
a) $-3100\ cm^2/Vs$ b) $-1500\ cm^2/Vs$ c) $-2500\ cm^2/Vs$ d) $-2000\ cm^2/Vs$

11) TWT is used as
a) Low noise RF amplifier b) High freq. RF amplifier
c) Both a) and b) d) None of these

12) In TWT electron beam is _____ and RF field is
a) Travelling, Stationary b) Stationary, Stationary
c) Travelling, Travelling d) Stationary, travelling

13) The maximum theoretical efficiency of two cavity klystron is
a) 22% b) 58% c) 85% d) 48%

14) In reflex klystron as Repeller Voltage is increases output power
a) Remains constant b) Increases
c) Decreases d) None of these

15) The average power depends on the transmitter power Pt and the duty cycle given by
a) Pavg=Pt*duty cycle b) Pavg=Pt*pulse width*prf
c) Both of the above d) None of these

16) Mostly preferred slow wave structure in TWT is
a) Zigzag b) Folded line back
c) Corrugated waveguide d) Helical

17) In case of Magnetron frequency pushing takes place due to _____ variations.
a) Supply b) Load c) Frequency d) Amplitude

18) _____ type of radar provides continuous range, bearing and elevation data on an object.
a) Searching b) Tracking c) Pulsed d) MTI

19) The Doppler effect causes a change in what aspect of rf energy that strikes a moving object.
a) Phase b) Frequency c) Energy d) None of these

20) Accurate Measurement of attenuation can be done by _____ method.
a) Power Ratio b) RF substitution
c) Using magic Tee d) Using slotted line

_____

SLR-EP – 141

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** : **(4×5=20)**

1) A transmission line has characteristic impedance of $z_0 = 50\,\Omega$ and resistance of 0.1 Ω /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** : **(2×10=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 m and b = 0.033 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^2, minimum detectable signal is 10^{-13} W and the radar cross sectional area of the target is 20 m^2.

   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** : **(2×10=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^2

      Cathode radius = 5 cm

      Anode radius = 10 cm

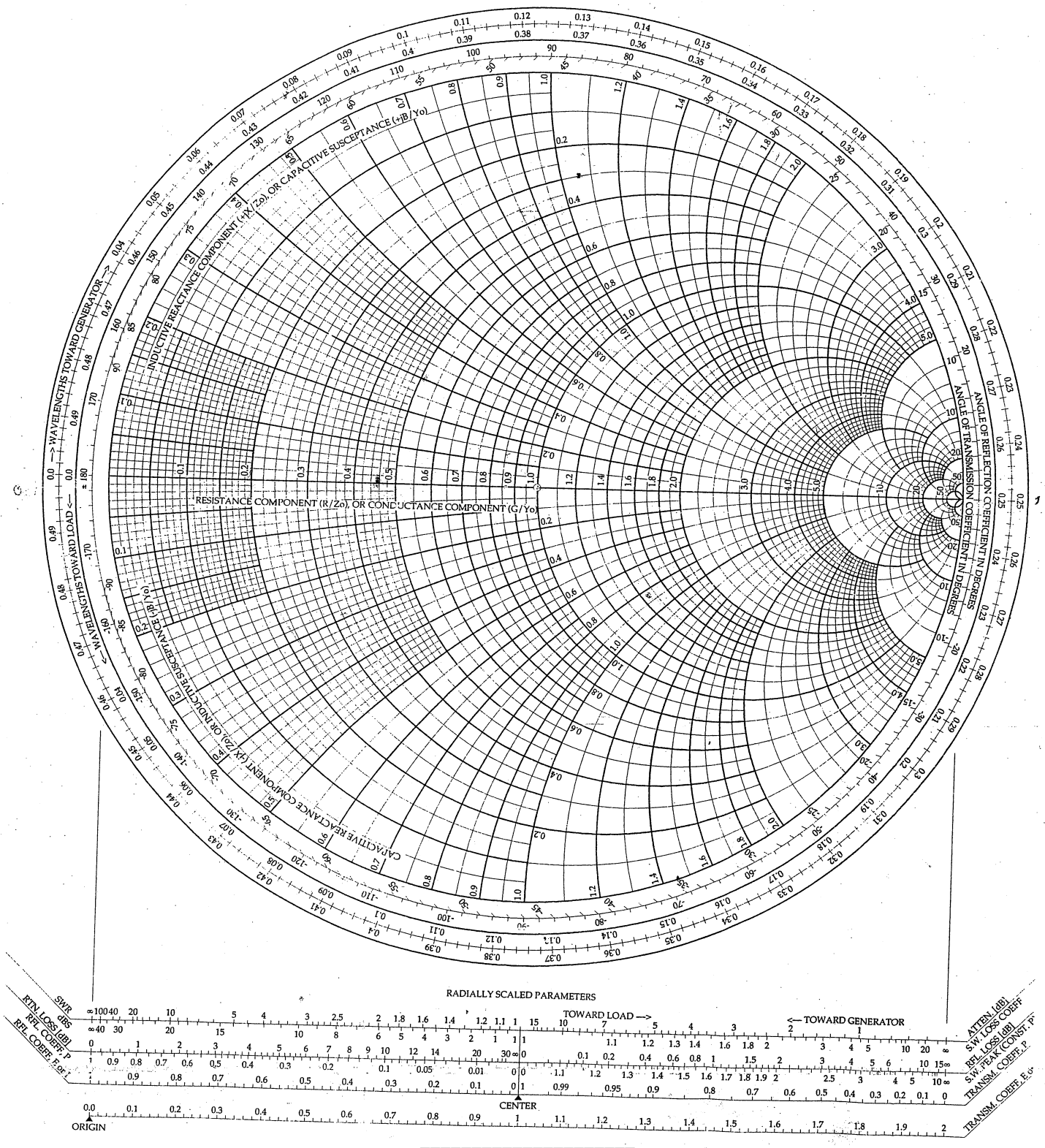
      Calculate :

      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



Set P

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SLR-EP – 141

Seat No.	

Set Q

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****.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(1×20=20)**

1) Mostly preferred slow wave structure in TWT is
   a) Zigzag b) Folded line back
   c) Corrugated waveguide d) Helical

2) In case of Magnetron frequency pushing takes place due to _____ variations.
   a) Supply b) Load c) Frequency d) Amplitude

3) _____ type of radar provides continuous range, bearing and elevation data on an object.
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4) The Doppler effect causes a change in what aspect of rf energy that strikes a moving object.
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6) In E plane Tee, if input is given to auxiliary arm, the output from main arms are
   a) In phase b) 90° out of phase
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7) An air filled rectangular waveguide of inside dimensions 7 cm × 3.5 cm operates in dominant mode. The cut of frequency is
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9) The characteristic impedance of transmission line is given as $z_0 =$
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10) The reflection coefficient is generally a complex quantity that can be expressed as $\overline{i} = |\overline{i}|e^{j\theta i}$. Then θ_i for open circuit is
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a) $(n + 1)\lambda/4$ b) $(n + 2)\ \lambda/4$ c) $(2n + 1)\ \lambda/4$ d) $n\lambda/4$

13) A n type GaAS Gunn diode have a length L = 210 μ m with a low field resistance of 16 Ω and applied voltage V = 59 V. Then the threshold electric field is
a) 2810 V/cm b) 2800 V/cm c) 2805 V/cm d) 2815 V/cm

14) In two valley theory, the negative resistance is achieved only when
a) $\Delta E = KT$ b) $\Delta E < KT$ c) $\Delta E > KT$ d) None of these

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_____

SLR-EP – 141

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** : **(4×5=20)**

1) A transmission line has characteristic impedance of $z_0 = 50\,\Omega$ and resistance of 0.1 Ω /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.

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4) Explain in detail measurement of unknown impedance using magic Tee.

5) Derive field equation for TE_{mn} mode.

3. Attempt **any two** : **(2×10=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.

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The cross sectional dimensions of the waveguide are given as a = 0.08 m and b = 0.033 m . Also calculate cut off frequency and guide wavelength of that mode.

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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^2, minimum detectable signal is 10^{-13} W and the radar cross sectional area of the target is 20 m^2.

   b) Draw a neat sketch of two cavity klystron amplifier. With the help of applegate diagram explain its working.

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      Anode voltage = 26 kV

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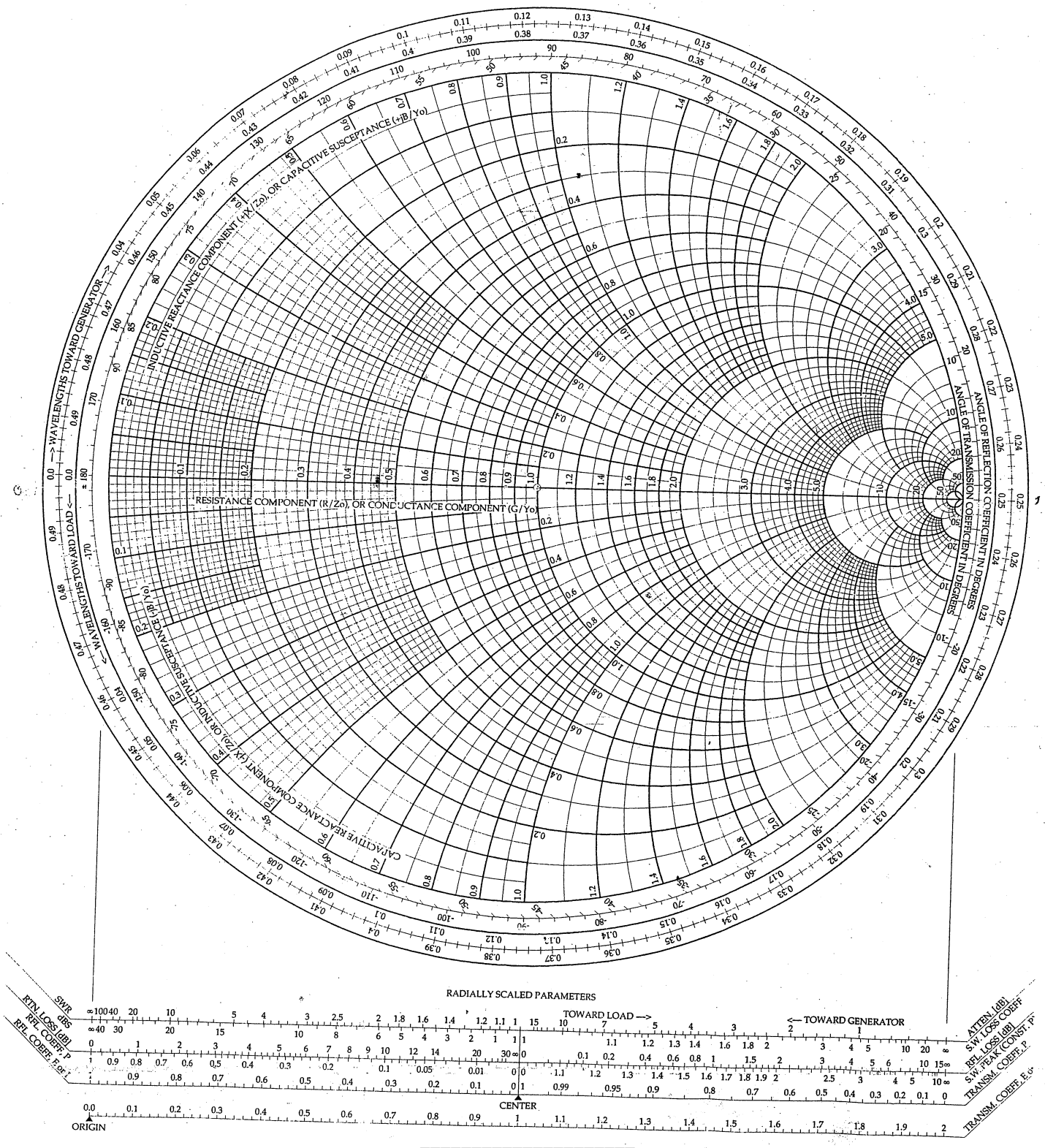
The Complete Smith Chart

Black Magic Design



Set Q

Set Q

SLR-EP – 141

Seat No.	

Set R

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.

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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P.T.O.

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SLR-EP – 141

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

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4) Explain in detail measurement of unknown impedance using magic Tee.

5) Derive field equation for TE_{mn} mode.

3. Attempt **any two** : **(2×10=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.

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The cross sectional dimensions of the waveguide are given as a = 0.08 m and b = 0.033 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^2, minimum detectable signal is 10^{-13} W and the radar cross sectional area of the target is 20 m^2.

   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** : **(2×10=20)**

   a) Write similarities and differences between TWT and Klystron. Explain construction and working of TWT.

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      Anode voltage = 26 kV

      Beam current = 27 A

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      Cathode radius = 5 cm

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      3) Cut-off magnetic flux density for given voltage.

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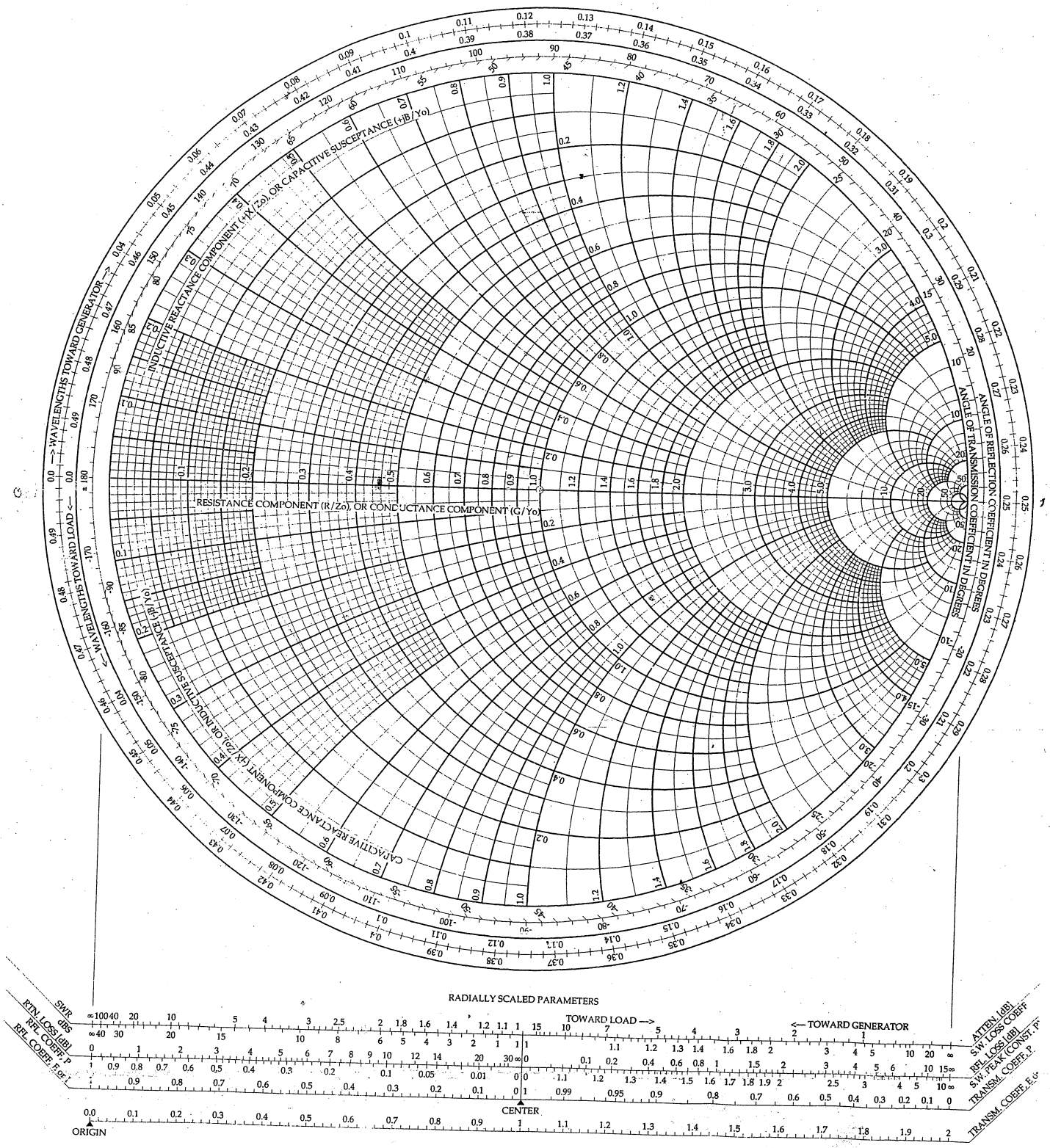
The Complete Smith Chart

Black Magic Design



Set R

Set R

SLR-EP – 141

Seat No.	

Set S

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****.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(1×20=20)**

1) In rectangular waveguide, lower order modes are not present in
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P.T.O.

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11) Mostly preferred slow wave structure in TWT is
   a) Zigzag b) Folded line back
   c) Corrugated waveguide d) Helical

12) In case of Magnetron frequency pushing takes place due to _____ variations.
   a) Supply b) Load c) Frequency d) Amplitude

13) _____ type of radar provides continuous range, bearing and elevation data on an object.
   a) Searching b) Tracking c) Pulsed d) MTI

14) The Doppler effect causes a change in what aspect of rf energy that strikes a moving object.
   a) Phase b) Frequency c) Energy d) None of these

15) Accurate Measurement of attenuation can be done by _____ method.
   a) Power Ratio b) RF substitution
   c) Using magic Tee d) Using slotted line

16) In E plane Tee, if input is given to auxiliary arm, the output from main arms are
   a) In phase b) 90° out of phase
   c) 180° out of phase d) 270° out of phase

17) An air filled rectangular waveguide of inside dimensions 7 cm × 3.5 cm operates in dominant mode. The cut of frequency is
   a) 2.14 GHz b) 21.4 GHz c) 2.14 MHz 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 impedance of transmission line is given as $z_0 =$
   a) $\sqrt{z/y}$ b) $\sqrt{zy}$ c) $\sqrt{z+y}$ d) $\sqrt{z-y}$

20) The reflection coefficient is generally a complex quantity that can be expressed as $\overline{i} = |\overline{i}|e^{j\theta i}$. Then θ_i for open circuit is
   a) 180° b) 0° c) 90° d) 270°

_____

SLR-EP – 141

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** : **(4×5=20)**

1) A transmission line has characteristic impedance of $z_0 = 50\,\Omega$ and resistance of 0.1 Ω /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** : **(2×10=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 m and b = 0.033 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^2, minimum detectable signal is 10^{-13} W and the radar cross sectional area of the target is 20 m^2.

   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** : **(2×10=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^2

      Cathode radius = 5 cm

      Anode radius = 10 cm

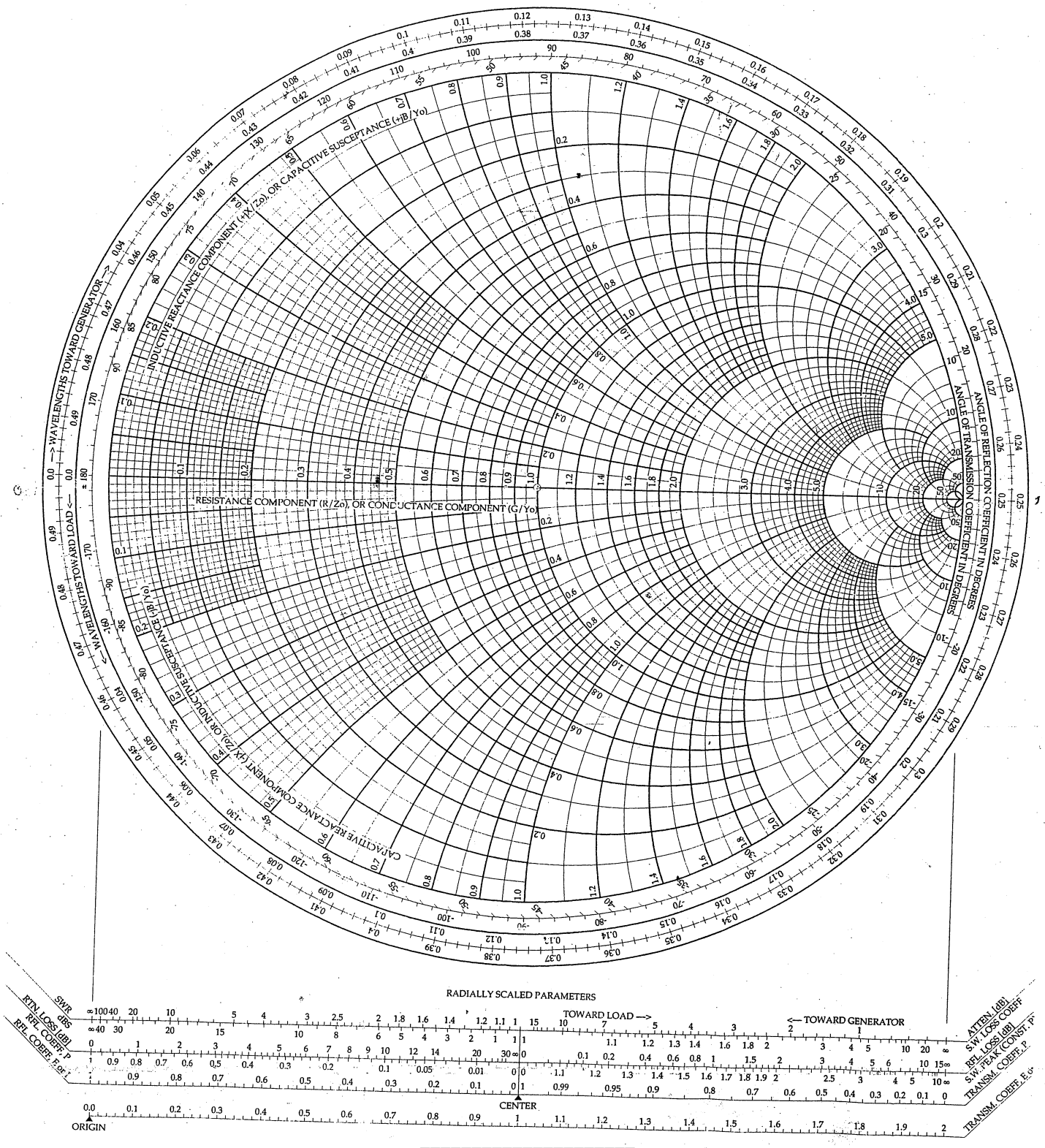
      Calculate :

      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



Set S

Set S

SLR-EP – 142

Seat No.	

Set **P**

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.

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) 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

2) Device pins XTAL1 and XTAL2 for the 8051 are used for connections to an external oscillator or crystal.
a) True b) False

3) The total external data memory that can be interfaced to the 8051 is
a) 32 K b) 64 K c) 128 K d) 256 K

4) The 8051 has _____ parallel I/O ports.
a) 2 b) 3 c) 4 d) 5

5) How many timers available in 8051 ?
a) 2 b) 8 c) 4 d) 6

6) The internal RAM memory of 8051 is
a) 64 bytes b) 128 bytes c) 32 bytes d) 256 bytes

7) After reset SP settles at the address
a) 1 H b) 0 H c) 7 H d) 6 H

8) On power up, the 8051 uses which RAM locations for register R0-R7
a) 00-2F b) 00-7F c) 00-07 d) 00-0F

P.T.O.

9) Which of the following commands will move the number 27 H into the accumulator ?
   a) MOV A, P27 b) MOV A, #27H
   c) MOV A, 27H d) MOV A, @27

10) When the 8051 is reset and the EA line is LOW, the program counter points to the first program instruction in the
   a) Internal code memory b) Internal data memory
   c) External code memory d) External data memory

11) PIC 16F877 devices _____ bit program counter capable of addressing _____ program memory.
   a) 8,256 K × 8 b) 16, 64 K × 8 c) 13, 8 K × 14 d) 14, 8 K × 13

12) Before execution of ANDLW O × 5f the working register contents were O × A3. The contents after execution will be
   a) O × 5f b) O × 03 c) O × FF d) None of these

13) After stack has been pushed eight times, the ninth push is
   a) Result in loss of pushed data
   b) Sets stack overflow bit
   c) Overwrites the value that was stored from the first push
   d) Overwrites the value that was stored from the last push

14) Interrupt flag bit get set when on interrupt condition occurs, regardless of state of its corresponding enable bit or global enable bit the statement is
   a) True for maskable interrupts only b) True for all interrupt
   c) False for all interrupts d) None of these

15) RTC DS1307 support _____ protocol.
   a) I2C b) SPI c) PSP d) All of the above

16) 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

17) In capture mode which timer is used ?
   a) Timer 0 b) Timer 1 c) Timer 2 d) Timer 3

18) In compare mode _____ is used.
   a) Timer 0 b) Timer 1 c) Timer 2 d) Timer 3

19) CCP means _____
   a) Capture Control Protocol b) Capture/Compare PWM
   c) Compare Control Protocol d) None of the above

20) The PWM period is specified by _____
   a) PR2 b) TMR2
   c) CCPCON d) None of the above

_____

SLR-EP – 142

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** : **(4×5=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** : **(2×10=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** : **(4×5=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** : **(2×10=20)**
   1) Explain in details I^2C module. Explain how to initialize MSSP module in I^2C 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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SLR-EP – 142

Seat No.	

Set **Q**

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.

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
   c) Compare Control Protocol d) None of the above

5) The PWM period is specified by _____
   a) PR2 b) TMR2
   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.
   a) True b) False

P.T.O.

8) The total external data memory that can be interfaced to the 8051 is
   a) 32 K b) 64 K c) 128 K d) 256 K

9) The 8051 has _____ parallel I/O ports.
   a) 2 b) 3 c) 4 d) 5

10) How many timers available in 8051 ?
   a) 2 b) 8 c) 4 d) 6

11) The internal RAM memory of 8051 is
   a) 64 bytes b) 128 bytes c) 32 bytes d) 256 bytes

12) After reset SP settles at the address
   a) 1 H b) 0 H c) 7 H d) 6 H

13) On power up, the 8051 uses which RAM locations for register R0-R7
   a) 00-2F b) 00-7F c) 00-07 d) 00-0F

14) Which of the following commands will move the number 27 H into the accumulator ?
   a) MOV A, P27 b) MOV A, #27H
   c) MOV A, 27H d) MOV A, @27

15) When the 8051 is reset and the EA line is LOW, the program counter points to the first program instruction in the
   a) Internal code memory b) Internal data memory
   c) External code memory d) External data memory

16) PIC 16F877 devices _____ bit program counter capable of addressing _____ program memory.
   a) 8,256 K × 8 b) 16, 64 K × 8 c) 13, 8 K × 14 d) 14, 8 K × 13

17) Before execution of ANDLW O × 5f the working register contents were O × A3. The contents after execution will be
   a) O × 5f b) O × 03 c) O × FF d) None of these

18) After stack has been pushed eight times, the ninth push is
   a) Result in loss of pushed data
   b) Sets stack overflow bit
   c) Overwrites the value that was stored from the first push
   d) Overwrites the value that was stored from the last push

19) Interrupt flag bit get set when on interrupt condition occurs, regardless of state of its corresponding enable bit or global enable bit the statement is
   a) True for maskable interrupts only b) True for all interrupt
   c) False for all interrupts d) None of these

20) RTC DS1307 support _____ protocol.
   a) I2C b) SPI c) PSP d) All of the above

_____

SLR-EP – 142

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** : **(4×5=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** : **(2×10=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** : **(4×5=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** : **(2×10=20)**
   1) Explain in details I^2C module. Explain how to initialize MSSP module in I^2C 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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SLR-EP – 142

Seat No.	

Set **R**

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.

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) PIC 16F877 devices _____ bit program counter capable of addressing _____ program memory.
a) 8,256 K × 8 b) 16, 64 K × 8 c) 13, 8 K × 14 d) 14, 8 K × 13

2) Before execution of ANDLW O × 5f the working register contents were O × A3. The contents after execution will be
a) O × 5f b) O × 03 c) O × FF d) None of these

3) After stack has been pushed eight times, the ninth push is
a) Result in loss of pushed data
b) Sets stack overflow bit
c) Overwrites the value that was stored from the first push
d) Overwrites the value that was stored from the last push

4) Interrupt flag bit get set when on interrupt condition occurs, regardless of state of its corresponding enable bit or global enable bit the statement is
a) True for maskable interrupts only b) True for all interrupt
c) False for all interrupts d) None of these

5) RTC DS1307 support _____ protocol.
a) I2C b) SPI c) PSP d) All of the above

6) 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

7) In capture mode which timer is used ?
a) Timer 0 b) Timer 1 c) Timer 2 d) Timer 3

8) In compare mode _____ is used.
   a) Timer 0 b) Timer 1 c) Timer 2 d) Timer 3

9) CCP means _____
   a) Capture Control Protocol b) Capture/Compare PWM
   c) Compare Control Protocol d) None of the above

10) The PWM period is specified by _____
   a) PR2 b) TMR2
   c) CCPCON d) None of the above

11) 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

12) Device pins XTAL1 and XTAL2 for the 8051 are used for connections to an external oscillator or crystal.
   a) True b) False

13) The total external data memory that can be interfaced to the 8051 is
   a) 32 K b) 64 K c) 128 K d) 256 K

14) The 8051 has _____ parallel I/O ports.
   a) 2 b) 3 c) 4 d) 5

15) How many timers available in 8051 ?
   a) 2 b) 8 c) 4 d) 6

16) The internal RAM memory of 8051 is
   a) 64 bytes b) 128 bytes c) 32 bytes d) 256 bytes

17) After reset SP settles at the address
   a) 1 H b) 0 H c) 7 H d) 6 H

18) On power up, the 8051 uses which RAM locations for register R0-R7
   a) 00-2F b) 00-7F c) 00-07 d) 00-0F

19) Which of the following commands will move the number 27 H into the accumulator ?
   a) MOV A, P27 b) MOV A, #27H
   c) MOV A, 27H d) MOV A, @27

20) When the 8051 is reset and the EA line is LOW, the program counter points to the first program instruction in the
   a) Internal code memory b) Internal data memory
   c) External code memory d) External data memory

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SLR-EP – 142

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** : **(4×5=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** : **(2×10=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** : **(4×5=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** : **(2×10=20)**
   1) Explain in details I^2C module. Explain how to initialize MSSP module in I^2C 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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SLR-EP – 142

Seat No.	

Set **S**

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.

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) The internal RAM memory of 8051 is
a) 64 bytes b) 128 bytes c) 32 bytes d) 256 bytes

2) After reset SP settles at the address
a) 1 H b) 0 H c) 7 H d) 6 H

3) On power up, the 8051 uses which RAM locations for register R0-R7
a) 00-2F b) 00-7F c) 00-07 d) 00-0F

4) Which of the following commands will move the number 27 H into the accumulator ?
a) MOV A, P27 b) MOV A, #27H
c) MOV A, 27H d) MOV A, @27

5) When the 8051 is reset and the EA line is LOW, the program counter points to the first program instruction in the
a) Internal code memory b) Internal data memory
c) External code memory d) External data memory

6) PIC 16F877 devices _____ bit program counter capable of addressing _____ program memory.
a) 8,256 K × 8 b) 16, 64 K × 8 c) 13, 8 K × 14 d) 14, 8 K × 13

7) Before execution of ANDLW O × 5f the working register contents were O × A3. The contents after execution will be
a) O × 5f b) O × 03 c) O × FF d) None of these

8) After stack has been pushed eight times, the ninth push is
a) Result in loss of pushed data
b) Sets stack overflow bit
c) Overwrites the value that was stored from the first push
d) Overwrites the value that was stored from the last push

9) Interrupt flag bit get set when on interrupt condition occurs, regardless of state of its corresponding enable bit or global enable bit the statement is
   a) True for maskable interrupts only b) True for all interrupt
   c) False for all interrupts d) None of these

10) RTC DS1307 support _____ protocol.
   a) I2C b) SPI c) PSP d) All of the above

11) 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

12) In capture mode which timer is used ?
   a) Timer 0 b) Timer 1 c) Timer 2 d) Timer 3

13) In compare mode _____ is used.
   a) Timer 0 b) Timer 1 c) Timer 2 d) Timer 3

14) CCP means _____
   a) Capture Control Protocol b) Capture/Compare PWM
   c) Compare Control Protocol d) None of the above

15) The PWM period is specified by _____
   a) PR2 b) TMR2
   c) CCPCON d) None of the above

16) 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

17) Device pins XTAL1 and XTAL2 for the 8051 are used for connections to an external oscillator or crystal.
   a) True b) False

18) The total external data memory that can be interfaced to the 8051 is
   a) 32 K b) 64 K c) 128 K d) 256 K

19) The 8051 has _____ parallel I/O ports.
   a) 2 b) 3 c) 4 d) 5

20) How many timers available in 8051 ?
   a) 2 b) 8 c) 4 d) 6

_____

SLR-EP – 142

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** : **(4×5=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** : **(2×10=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.

Set S

4. Answer **any four** : **(4×5=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** : **(2×10=20)**
   1) Explain in details I^2C module. Explain how to initialize MSSP module in I^2C 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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SLR-EP – 143

Seat No.	

Set **P**

T.E. (E & TC) (Part – II) Examination, 2016
ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date : Wednesday, 23-11-2016 Max. Marks : 100
Time : 10.00 a.m. to 1.00 p.m.

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

I. Choose the correct answer : **20**

1) The turn-off time of a thyristor effects its
   A) Operating voltage B) Operating frequency
   C) Overload capacity D) Thermal behaviour

2) Consider the following statements :
   i) DIAC is a two electrode, bidirectional avalanche diode
   ii) DIAC can be switched from OFF state to ON state for either polarity of applied voltage
   iii) DIAC exhibits negative resistance property
   iv) DIAC is used mainly for triggering a TRIAC

   Of these statements, the following are correct
   A) i, ii and iii B) ii, iii and iv C) i, iii and iv D) All of the above

3) In a single phase bridge converter, for firing angle $\alpha = 0$, the dc output voltage is
   A) V_m/π B) $2\ V_m/\pi$ C) $\sqrt{2}\ V_m/\pi$ D) $V_m/\sqrt{2}\,\pi$

4) In a single phase full wave converter with freewheel diode, with firing angle of 60°, and amplitude of input voltage to each thyristor V_m of 100 volts, the dc output voltage is about
   A) $100/\pi$ Volts B) $150/\pi$ Volts C) $50/\pi$ Volts D) 150 Volts

5) A fully controlled converter implies a converter in which
   A) All rectifying elements are pn diodes
   B) Rectifying elements are both thyristors and diodes
   C) All rectifying elements are thyristors or power transistors
   D) Freewheeling diode is used

6) A single phase fully controlled converter with highly inductive load and freewheeling diode provides _____ direction of voltage and _____ direction of current.
   A) positive, negative B) positive, positive
   C) negative, negative D) negative, positive

7) In SCR angle of conduction can be varied by changing
   A) Anode voltage B) Anode current
   C) Forward current rating D) Gate current

8) In a PLL frequency synthesizer, a value of divide-by-N network varies from 10 to 999 in a single steps increment with f_{in} = 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 999 KHz in 1 KHz increments
   D) 1 KHz to 9990 KHz in 1 KHz increments

9) Which of the following PLL has very low power consumption ?
   A) 565 B) 4046 C) Both (A) and (B) D) None of these

10) IC 1596 is a
   A) Frequency counter B) Digital voltmeter
   C) Low signal amplifier D) Balanced modulator-demodulator

11) Which of following temperature sensor has sensitivity 10 mV/°C ?
   A) LM35 B) J-type thermocouple
   C) PT100 D) None of above

12) 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

13) 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

14) A high level signal on display select input, display output of
   A) Latches B) Counters C) Both (A) and (B) D) None of these

15) 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

16) Which of the following is self-powered temperature sensor ?
   A) Thermocouple B) Thermistor C) RTD D) LM 35

17) The first instruction on the rung must always be an
   A) Input instruction B) Output instruction
   C) (A) or (B) D) All of these

18) For input voltage range of 0-2V, t_2 = 2000, required DVM display is
   A) 2 digit B) 3 digit C) $3\frac{1}{2}$ digit D) 4 digit

19) 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) $V_e = V_{PV} - V_{SP}$ D) $V_e = V_{PV} * V_{SP}$

20) The number of displays required to count frequency 1 MHz with 1 Hz accuracy using IC74926 are
   A) 3 B) 4 C) 5 D) 6

Set P

SLR-EP – 143

Seat No.	

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****.*
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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.

Set P

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 $V_{in} = \pm 2V$.

SLR-EP – 143

Seat No.	

Set **Q**

T.E. (E & TC) (Part – II) Examination, 2016
ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

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

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

I. Choose the correct answer : **20**

1) Which of the following is self-powered temperature sensor ?
A) Thermocouple B) Thermistor C) RTD D) LM 35

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P.T.O.

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13) In a PLL frequency synthesizer, a value of divide-by-N network varies from 10 to 999 in a single steps increment with f_{in} = 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 999 KHz in 1 KHz increments
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14) Which of the following PLL has very low power consumption ?
A) 565 B) 4046 C) Both (A) and (B) D) None of these

15) IC 1596 is a
A) Frequency counter B) Digital voltmeter
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16) Which of following temperature sensor has sensitivity 10 mV/°C ?
A) LM35 B) J-type thermocouple
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17) In XR 2240 if both trigger and reset signal are applied simultaneously then
A) Trigger is activated B) Reset is activated
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18) Divide by 2 network is used in the path of low frequency signal in which of following measurement ?
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19) A high level signal on display select input, display output of
A) Latches B) Counters C) Both (A) and (B) D) None of these

20) Which of the following characteristics are required for selection of instrumentation amplifier ?
A) High input impedance B) High CMRR
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_____

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Seat No.	

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.

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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.

Set Q

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**

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2) Design a $3\frac{1}{2}$ digit DVM for measurement of $V_{in} = \pm 2V$.

SLR-EP – 143

Seat No.	

Set **R**

T.E. (E & TC) (Part – II) Examination, 2016
ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

I. Choose the correct answer : **20**

1) Which of following temperature sensor has sensitivity 10 mV/°C ?
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P.T.O.

10) The number of displays required to count frequency 1 MHz with 1 Hz accuracy using IC74926 are
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12) Consider the following statements :
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19) Which of the following PLL has very low power consumption ?
A) 565 B) 4046 C) Both (A) and (B) D) None of these

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_____

SLR-EP – 143

Seat No.	

T.E. (E & TC) (Part – II) Examination, 2016
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SECTION – I

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i) Explain two transistor analogy of an SCR.
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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.
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4) Draw and explain PLC architecture.

Set R

V. Attempt **any two** : **15**

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2) Draw and explain ladder diagram for bottle filling plant system.

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SLR-EP – 143

Seat No.	

Set **S**

T.E. (E & TC) (Part – II) Examination, 2016
ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

I. Choose the correct answer : **20**

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SLR-EP – 143

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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.

Set S

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 $V_{in} = \pm 2V$.

SLR-EP – 144

Seat No.	

Set **P**

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.

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- ***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 ϕ_1 and refraction ϕ_2 are related to each other and to the refractive indices of the dielectrics n_1 and n_2 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 μW and the mean optical power at the output is 3 μW. 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

P.T.O.

8) LASER is a _____ type of source.
A) Coherent B) Non-coherent C) Spontaneous D) None of these

9) A GaAs injection LASER has a total efficiency of 18%. If the voltage applied to the device is 2.5 V and the bandgap energy of GaAs is 1.43 eV, the external power efficiency of the device is
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10) Which of the following is best single-frequency injection LASER ?
A) Index guided LASER B) Gain guided LASER
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15) The common method for time domain dispersion measurement is
A) Multimode optical fiber B) Single step index optical fiber
C) Single graded index optical fiber D) All plastic fiber

16) Which method is employed for interferometric measurement ?
A) Transmitted light interferometer B) Reflected light interferometer
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18) The requirement of detector is
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19) The detail knowledge of the refractive index profile enables the
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_____

SLR-EP – 144

Seat No.	

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 :
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SECTION – I

2. A) Solve **any three** of the following : **(3×4=12)**

1) Explain the general block diagram of an optical communication system.

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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 μm. Determine the number of longitudinal modes and their frequency separation. **8**

3. A) Solve **any two** of the following : **(2×6=12)**

1) Explain double crucible method of fiber drawing. What are its advantages and drawbacks ?

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3) Explain injection laser characteristics.

B) Silica has an estimated fictive temperature of 1400°K with an isothermal compressibility of 7×10^{-11} m^2/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 μm. Boltzmann's constant is 1.381×10^{-21} J/°K. **8**

SECTION – II

4. a) Attempt **any three** questions : **(3×4=12)**

   1) Explain the different advantages and disadvantages of LED as compare to laser.

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SLR-EP – 144

Seat No.	

Set **Q**

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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SLR-EP – 144

Seat No.	

T.E. (E & TC) (Part – II) Examination, 2016
OPTICAL COMMUNICATION

Day and Date : Thursday, 24-11-2016 Marks : 80
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SECTION – I

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SECTION – II

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SLR-EP – 144

Seat No.	

Set **R**

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OPTICAL COMMUNICATION

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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P.T.O.

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SLR-EP – 144

Seat No.	

T.E. (E & TC) (Part – II) Examination, 2016
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SECTION – I

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SECTION – II

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SLR-EP – 144

Seat No.	

Set **S**

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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D) None of above

16) The angles of incidence ϕ_1 and refraction ϕ_2 are related to each other and to the refractive indices of the dielectrics n_1 and n_2 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) $n_1 \sin \phi_2 = n_2 \sin\phi_1$

17) 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

18) 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

19) 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

20) 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

_____

SLR-EP – 144

Seat No.	

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 : **(3×4=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 μm. Determine the number of longitudinal modes and their frequency separation. **8**

3. A) Solve **any two** of the following : **(2×6=12)**

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°K with an isothermal compressibility of 7×10^{-11} m^2/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 μm. Boltzmann's constant is 1.381×10^{-21} J/°K. **8**

SECTION – II

4. a) Attempt **any three** questions : **(3×4=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 μm depletion layer width is 3×10^4 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. **8**

5. a) Attempt **any two** questions : **(2×6=12)**

   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. **8**

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SLR-EP – 145

Seat No.	

Set P

T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016
MOBILE COMMUNICATION

Day and Date : Friday, 25-11-2016 Max. Marks : 100
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 : 20

1. Choose the correct answer : **(20×1=20)**

1) Which of the following channel is used for voice transmission from the MS to BS ?
a) RVC b) FVC c) FCC d) RCC

2) The technique adopted to increase the system capacity and reduce co-channel interference.
a) Sectorization b) Trunking c) GOS d) None of these

3) The design process of selecting and allocating channel group for all the base station within system is called as
a) Frequency reuse b) Handoff
c) Umbrella cell approach d) None of these

4) To reduce co-channel interference
a) Decrease the separation between the cell
b) Increase the separation between the cell
c) Increase the antenna height
d) None of these

5) The angle at which no. reflection occurs in the medium of origin ?
a) Brewster angle b) Doppler angle c) Perfect angle d) None of these

6) The model which reasonably accurate for predicting large scale signal strength over several kilometer is
a) Reflection b) Diffraction c) Two ray model d) None of above

7) RMS delay spread is related to
a) Time dispersion parameter b) Coherence bandwidth
c) Coherence time d) Doppler spread

8) In TDMA/FDD the forward and reverse channel frequencies _____ while in TDMA/TDD _____
   a) differ, same b) same, differ c) same, same d) differ, differ

9) _____ uses signals which have a transmission bandwidth that is several times greater than minimum required RF bandwidth.
   a) TDMA b) SDMA c) FDMA d) SSMA

10) Receives a stronger signal by the receiver due to directional antenna gain and less interference is
   a) SDMA b) TDMA c) SSMA d) Both a and b

11) Which of the following is based on CDMA ?
   a) Soft Hand-off b) Hard hand-off c) Both a and b d) None of these

12) GSM stands for
   a) Global Service for Mobile b) Global System for Mobile
   c) Group of Special Machines d) Global Scope for Mobile

13) The _____ is the database at MSC that keeps the information about the identity of mobile phone equipment.
   a) HLR b) VLR c) AuC d) EIR

14) In mobile station and base station downlink is also referred as
   a) uplink b) forward link c) reverse link d) none

15) Which of the following are functions of MSC ?
   a) Control BTS
   b) To accept a call or a hand-off
   c) To provide services to all mobile stations
   d) All of the above

16) Types of handover is
   a) Soft handover b) Hard handover
   c) Both a and b d) None

17) Modulation techniques used in CDMA 2000 is
   a) Uplink-QPSK downlink-BPSK b) Uplink-BPSK downlink-BPSK
   c) Uplink-BPSK downlink-QPSK d) None

18) Standard GSM systems support a data rate of
   a) 9.6 kbps b) 64 kbps c) 128 kbps d) 120 kbps

19) In paging framing channel, paging channel slot consists of
   a) 8 half frames b) 6 half frames c) 10 half frames d) 18 half frames

20) The logical channels are called _____ channels in W-CDMA.
   a) Transport b) Pilot c) Reverse pilot d) Global

_____

SLR-EP – 145

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^2, a total of 1001 radio channels are available for traffic handling and the area of one cell is 18 km^2.
      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 : **(4×4=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 : **(8×3=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

Seat No.	

Set Q

T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016
MOBILE COMMUNICATION

Day and Date : Friday, 25-11-2016 Max. Marks : 100
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 : 20

1. Choose the correct answer : **(20×1=20)**

1) Types of handover is
   a) Soft handover b) Hard handover
   c) Both a and b d) None

2) Modulation techniques used in CDMA 2000 is
   a) Uplink-QPSK downlink-BPSK b) Uplink-BPSK downlink-BPSK
   c) Uplink-BPSK downlink-QPSK d) None

3) Standard GSM systems support a data rate of
   a) 9.6 kbps b) 64 kbps c) 128 kbps d) 120 kbps

4) In paging framing channel, paging channel slot consists of
   a) 8 half frames b) 6 half frames c) 10 half frames d) 18 half frames

5) The logical channels are called _____ channels in W-CDMA.
   a) Transport b) Pilot c) Reverse pilot d) Global

6) Which of the following channel is used for voice transmission from the MS to BS ?
   a) RVC b) FVC c) FCC d) RCC

7) The technique adopted to increase the system capacity and reduce co-channel interference.
   a) Sectorization b) Trunking c) GOS d) None of these

8) The design process of selecting and allocating channel group for all the base station within system is called as
   a) Frequency reuse b) Handoff
   c) Umbrella cell approach d) None of these

P.T.O.

9) To reduce co-channel interference
   a) Decrease the separation between the cell
   b) Increase the separation between the cell
   c) Increase the antenna height
   d) None of these

10) The angle at which no. reflection occurs in the medium of origin ?
   a) Brewster angle b) Doppler angle c) Perfect angle d) None of these

11) The model which reasonably accurate for predicting large scale signal strength over several kilometer is
   a) Reflection b) Diffraction c) Two ray model d) None of above

12) RMS delay spread is related to
   a) Time dispersion parameter b) Coherence bandwidth
   c) Coherence time d) Doppler spread

13) In TDMA/FDD the forward and reverse channel frequencies _____ while in TDMA/TDD _____
   a) differ, same b) same, differ c) same, same d) differ, differ

14) _____ uses signals which have a transmission bandwidth that is several times greater than minimum required RF bandwidth.
   a) TDMA b) SDMA c) FDMA d) SSMA

15) Receives a stronger signal by the receiver due to directional antenna gain and less interference is
   a) SDMA b) TDMA c) SSMA d) Both a and b

16) Which of the following is based on CDMA ?
   a) Soft Hand-off b) Hard hand-off c) Both a and b d) None of these

17) GSM stands for
   a) Global Service for Mobile b) Global System for Mobile
   c) Group of Special Machines d) Global Scope for Mobile

18) The _____ is the database at MSC that keeps the information about the identity of mobile phone equipment.
   a) HLR b) VLR c) AuC d) EIR

19) In mobile station and base station downlink is also referred as
   a) uplink b) forward link c) reverse link d) none

20) Which of the following are functions of MSC ?
   a) Control BTS
   b) To accept a call or a hand-off
   c) To provide services to all mobile stations
   d) All of the above

SLR-EP – 145

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^2, a total of 1001 radio channels are available for traffic handling and the area of one cell is 18 km^2.
      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 : **(4×4=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 : **(8×3=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.

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Seat No.	

Set R

T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016
MOBILE COMMUNICATION

Day and Date : Friday, 25-11-2016 Max. Marks : 100
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 : 20

1. Choose the correct answer : **(20×1=20)**

1) Which of the following is based on CDMA ?
a) Soft Hand-off b) Hard hand-off c) Both a and b d) None of these

2) GSM stands for
a) Global Service for Mobile b) Global System for Mobile
c) Group of Special Machines d) Global Scope for Mobile

3) The _____ is the database at MSC that keeps the information about the identity of mobile phone equipment.
a) HLR b) VLR c) AuC d) EIR

4) In mobile station and base station downlink is also referred as
a) uplink b) forward link c) reverse link d) none

5) Which of the following are functions of MSC ?
a) Control BTS
b) To accept a call or a hand-off
c) To provide services to all mobile stations
d) All of the above

6) Types of handover is
a) Soft handover b) Hard handover
c) Both a and b d) None

7) Modulation techniques used in CDMA 2000 is
a) Uplink-QPSK downlink-BPSK b) Uplink-BPSK downlink-BPSK
c) Uplink-BPSK downlink-QPSK d) None

8) Standard GSM systems support a data rate of
a) 9.6 kbps b) 64 kbps c) 128 kbps d) 120 kbps

P.T.O.

9) In paging framing channel, paging channel slot consists of
a) 8 half frames b) 6 half frames c) 10 half frames d) 18 half frames

10) The logical channels are called _____ channels in W-CDMA.
a) Transport b) Pilot c) Reverse pilot d) Global

11) Which of the following channel is used for voice transmission from the MS to BS ?
a) RVC b) FVC c) FCC d) RCC

12) The technique adopted to increase the system capacity and reduce co-channel interference.
a) Sectorization b) Trunking c) GOS d) None of these

13) The design process of selecting and allocating channel group for all the base station within system is called as
a) Frequency reuse b) Handoff
c) Umbrella cell approach d) None of these

14) To reduce co-channel interference
a) Decrease the separation between the cell
b) Increase the separation between the cell
c) Increase the antenna height
d) None of these

15) The angle at which no. reflection occurs in the medium of origin ?
a) Brewster angle b) Doppler angle c) Perfect angle d) None of these

16) The model which reasonably accurate for predicting large scale signal strength over several kilometer is
a) Reflection b) Diffraction c) Two ray model d) None of above

17) RMS delay spread is related to
a) Time dispersion parameter b) Coherence bandwidth
c) Coherence time d) Doppler spread

18) In TDMA/FDD the forward and reverse channel frequencies _____ while in TDMA/TDD _____
a) differ, same b) same, differ c) same, same d) differ, differ

19) _____ uses signals which have a transmission bandwidth that is several times greater than minimum required RF bandwidth.
a) TDMA b) SDMA c) FDMA d) SSMA

20) Receives a stronger signal by the receiver due to directional antenna gain and less interference is
a) SDMA b) TDMA c) SSMA d) Both a and b

_____

SLR-EP – 145

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^2, a total of 1001 radio channels are available for traffic handling and the area of one cell is 18 km^2.
      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 : **(4×4=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 : **(8×3=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

Seat No.	

Set S

T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016
MOBILE COMMUNICATION

Day and Date : Friday, 25-11-2016 Max. Marks : 100
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 : 20

1. Choose the correct answer : **(20×1=20)**

1) The model which reasonably accurate for predicting large scale signal strength over several kilometer is
a) Reflection b) Diffraction c) Two ray model d) None of above

2) RMS delay spread is related to
a) Time dispersion parameter b) Coherence bandwidth
c) Coherence time d) Doppler spread

3) In TDMA/FDD the forward and reverse channel frequencies _____ while in TDMA/TDD _____
a) differ, same b) same, differ c) same, same d) differ, differ

4) _____ uses signals which have a transmission bandwidth that is several times greater than minimum required RF bandwidth.
a) TDMA b) SDMA c) FDMA d) SSMA

5) Receives a stronger signal by the receiver due to directional antenna gain and less interference is
a) SDMA b) TDMA c) SSMA d) Both a and b

6) Which of the following is based on CDMA ?
a) Soft Hand-off b) Hard hand-off c) Both a and b d) None of these

7) GSM stands for
a) Global Service for Mobile b) Global System for Mobile
c) Group of Special Machines d) Global Scope for Mobile

8) The _____ is the database at MSC that keeps the information about the identity of mobile phone equipment.
a) HLR b) VLR c) AuC d) EIR

P.T.O.

9) In mobile station and base station downlink is also referred as
   a) uplink b) forward link c) reverse link d) none
10) Which of the following are functions of MSC ?
   a) Control BTS
   b) To accept a call or a hand-off
   c) To provide services to all mobile stations
   d) All of the above
11) Types of handover is
   a) Soft handover b) Hard handover
   c) Both a and b d) None
12) Modulation techniques used in CDMA 2000 is
   a) Uplink-QPSK downlink-BPSK b) Uplink-BPSK downlink-BPSK
   c) Uplink-BPSK downlink-QPSK d) None
13) Standard GSM systems support a data rate of
   a) 9.6 kbps b) 64 kbps c) 128 kbps d) 120 kbps
14) In paging framing channel, paging channel slot consists of
   a) 8 half frames b) 6 half frames c) 10 half frames d) 18 half frames
15) The logical channels are called _____ channels in W-CDMA.
   a) Transport b) Pilot c) Reverse pilot d) Global
16) Which of the following channel is used for voice transmission from the MS to BS ?
   a) RVC b) FVC c) FCC d) RCC
17) The technique adopted to increase the system capacity and reduce co-channel interference.
   a) Sectorization b) Trunking c) GOS d) None of these
18) The design process of selecting and allocating channel group for all the base station within system is called as
   a) Frequency reuse b) Handoff
   c) Umbrella cell approach d) None of these
19) To reduce co-channel interference
   a) Decrease the separation between the cell
   b) Increase the separation between the cell
   c) Increase the antenna height
   d) None of these
20) The angle at which no. reflection occurs in the medium of origin ?
   a) Brewster angle b) Doppler angle c) Perfect angle d) None of these

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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^2, a total of 1001 radio channels are available for traffic handling and the area of one cell is 18 km^2.
      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 : **(4×4=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 : **(8×3=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 **P**

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

1. Choose the correct answer : **(10×1=10)**

1) A group of four bits is known as
a) nibble b) byte c) bit d) all of above

2) _____ is used to store the data and program.
a) Memory unit b) Input unit
c) Output unit d) None of the above

3) ROM stands for
a) Read Only Memory b) Random Only Memory
c) Read Online Memory d) None of the above

4) In _____ representation, numbers are represented by mantissa comprising the significant digits and an exponent part of radix.
a) Floating point b) Fixed point
c) Decimal number d) None of the above

5) LRU stands for
a) Least Recently Used b) Last Recently Used
c) Last Randomly Used d) None of the above

SECTION – II

6) _____ are the different types of generating control signals.
   a) Microprogrammed b) Hardwired
   c) Microinstruction d) Both a and b

7) Hardwired control generator consists of
   a) Decoder/Encoder b) Condition codes
   c) Control/step counter d) All of the above

8) In microprogrammed approach, signals are generated by
   a) machine instructions b) system programs
   c) utility tools d) none of the above

9) After the compilation of DMA transfer processor is notified by
   a) Acknowledge signal b) Interrupt signal
   c) WMFC signal d) None of the above

10) DMA controller has _____ registers.
   a) 1 b) 2 c) 3 d) 4

_____

SLR-EP – 146(a)

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.

_____

Set P

SLR-EP – 146(a)

Seat No.	

Set Q

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

1. Choose the correct answer : **(10×1=10)**

1) LRU stands for
   a) Least Recently Used b) Last Recently Used
   c) Last Randomly Used d) None of the above

2) In _____ representation, numbers are represented by mantissa comprising the significant digits and an exponent part of radix.
   a) Floating point b) Fixed point
   c) Decimal number d) None of the above

3) ROM stands for
   a) Read Only Memory b) Random Only Memory
   c) Read Online Memory d) None of the above

4) _____ is used to store the data and program.
   a) Memory unit b) Input unit
   c) Output unit d) None of the above

5) A group of four bits is known as
   a) nibble b) byte c) bit d) all of above

P.T.O.

SECTION – II

6) DMA controller has _____ registers.
   a) 1 b) 2 c) 3 d) 4

7) After the compilation of DMA transfer processor is notified by
   a) Acknowledge signal b) Interrupt signal
   c) WMFC signal d) None of the above

8) In microprogrammed approach, signals are generated by
   a) machine instructions b) system programs
   c) utility tools d) none of the above

9) Hardwired control generator consists of
   a) Decoder/Encoder b) Condition codes
   c) Control/step counter d) All of the above

10) _____ are the different types of generating control signals.
   a) Microprogrammed b) Hardwired
   c) Microinstruction d) Both a and b

_____

SLR-EP – 146(a)

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.

_____

Set Q

Set Q

SLR-EP – 146(a)

Seat No.	

Set **R**

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

1. Choose the correct answer : **(10×1=10)**

1) In _____ representation, numbers are represented by mantissa comprising the significant digits and an exponent part of radix.
   a) Floating point b) Fixed point
   c) Decimal number d) None of the above

2) ROM stands for
   a) Read Only Memory b) Random Only Memory
   c) Read Online Memory d) None of the above

3) LRU stands for
   a) Least Recently Used b) Last Recently Used
   c) Last Randomly Used d) None of the above

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
   c) Output unit d) None of the above

P.T.O.

SECTION – II

6) After the compilation of DMA transfer processor is notified by
   a) Acknowledge signal b) Interrupt signal
   c) WMFC signal d) None of the above

7) In microprogrammed approach, signals are generated by
   a) machine instructions b) system programs
   c) utility tools d) none of the above

8) DMA controller has _____ registers.
   a) 1 b) 2 c) 3 d) 4

9) _____ are the different types of generating control signals.
   a) Microprogrammed b) Hardwired
   c) Microinstruction d) Both a and b

10) Hardwired control generator consists of
   a) Decoder/Encoder b) Condition codes
   c) Control/step counter d) All of the above

_____

SLR-EP – 146(a)

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.

_____

Set R

Set R

SLR-EP – 146(a)

Seat No.	

Set **S**

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

1. Choose the correct answer : **(10×1=10)**

1) ROM stands for
   a) Read Only Memory b) Random Only Memory
   c) Read Online Memory d) None of the above

2) _____ is used to store the data and program.
   a) Memory unit b) Input unit
   c) Output unit d) None of the above

3) A group of four bits is known as
   a) nibble b) byte c) bit d) all of above

4) LRU stands for
   a) Least Recently Used b) Last Recently Used
   c) Last Randomly Used d) None of the above

5) In _____ representation, numbers are represented by mantissa comprising the significant digits and an exponent part of radix.
   a) Floating point b) Fixed point
   c) Decimal number d) None of the above

SECTION – II

6) In microprogrammed approach, signals are generated by
   a) machine instructions b) system programs
   c) utility tools d) none of the above

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 types of generating control signals.
   a) Microprogrammed b) Hardwired
   c) Microinstruction d) Both a and b

9) DMA controller has _____ registers.
   a) 1 b) 2 c) 3 d) 4

10) After the compilation of DMA transfer processor is notified by
   a) Acknowledge signal b) Interrupt signal
   c) WMFC signal d) None of the above

_____

SLR-EP – 146(a)

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.

_____

Set S

SLR-EP-146(b)

Seat No.	

Set P

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 : **(10×1=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

P.T.O.

4) In Unix, which system call creates the new process ?
   a) fork
   b) create
   c) new
   d) none of the mentioned

5) 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

6) 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

7) 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

8) Round robin scheduling falls under the 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 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

10) 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

SLR-EP-146(b)

Seat No.	

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.

Set P

SLR-EP-146(b)

Seat No.	

Set **Q**

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 : **(10×1=10)**

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
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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

10) 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

SLR-EP-146(b)

Seat No.	

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.

Set Q

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 answer : **(10×1=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

P.T.O.

5) 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

6) In Unix, which system call creates the new process ?
   a) fork
   b) create
   c) new
   d) none of the mentioned

7) 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

8) 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

9) 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

10) Round robin scheduling falls under the category of
   a) Non preemptive scheduling
   b) Preemptive scheduling
   c) None of these
   d) All of the above

SLR-EP-146(b)

Seat No.	

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.

Set R

SLR-EP-146(b)

Seat No.	

Set **S**

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 : **(10×1=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

5) 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

6) Round robin scheduling falls under 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 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

8) Which one of the following is the address generated by CPU ?
   a) physical address
   b) absolute address
   c) logical address
   d) none of the mentioned

9) 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

10) 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

SLR-EP-146(b)

Seat No.	

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.

Set S

SLR-EP – 146(c)

Seat No.	

Set P

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

P.T.O.

6) 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

7) 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

8) 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

9) 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

10) 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

———————

SLR-EP – 146(c)

Seat No.	

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**

7. Solve the following : **10**
   a) With the help of neat sketches, explain briefly the various illumination techniques.
   b) Draw and explain block diagram of MEMS.

Set P

SLR-EP – 146(c)

Seat No.	

Set Q

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

2) 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

P.T.O.

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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SLR-EP – 146(c)

Seat No.	

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**

7. Solve the following : **10**
   a) With the help of neat sketches, explain briefly the various illumination techniques.
   b) Draw and explain block diagram of MEMS.

Set Q

SLR-EP – 146(c)

Seat No.	

Set R

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 following is a sensor that measures the movement of an object ?
   a) Pressure sensor b) Motion sensor
   c) Action sensor d) Touch sensor

2) 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

3) 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

4) 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

5) 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

P.T.O.

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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SLR-EP – 146(c)

Seat No.	

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**

7. Solve the following : **10**
   a) With the help of neat sketches, explain briefly the various illumination techniques.
   b) Draw and explain block diagram of MEMS.

Set R

SLR-EP – 146(c)

Seat No.	

Set S

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) 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

P.T.O.

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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SLR-EP – 146(c)

Seat No.	

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**

7. Solve the following : **10**
   a) With the help of neat sketches, explain briefly the various illumination techniques.
   b) Draw and explain block diagram of MEMS.

Set S

SLR-EP – 147

Seat No.	

Set **P**

T.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2016
INDUSTRIAL ELECTRONICS (Old)

Day and Date : Saturday, 10-12-2016 Total Marks : 100
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) Figures to the ***right*** *indicate* ***full*** *marks.*
4) Assume data, ***if*** *necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) The SCR is turned-off when the anode current falls below
A) Forward current rating B) Breakover voltage
C) Holding current D) Latching current

2) The object of connecting resistance and capacitance across gate circuit is to protect the thyristor gate against
A) Overvoltage B) dv/dt
C) Noise signals D) None of these

3) An UJT exhibits negative resistance region
A) Before the break point B) Between peak and valley point
C) After the valley point D) Both (A) and (C)

4) The MOSFET combines the areas of _____ and _____
A) Field effect and MOS technology
B) Semiconductor and TTL
C) MOS technology and CMOS technology
D) None of the mentioned

5) The SCR is a _____ switch.
A) Two-directional B) Uni-directional
C) Three-directional D) Four-directional

6) Thyristor equivalent of thyratron tube is
A) SCR B) UJT C) Diac D) Triac

7) 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 at load frequency

8) A single phase full bridge inverter can operate in load commutation mode in case load consists of
A) RLC overdamaped B) RLC underdamped
C) RLC critically damped D) None of these

9) The ratio of latching current to holding current SCR is
A) 0.5 B) 1.0 C) 1.5 D) 2.5

P.T.O.

10) The single pulse modulation of PWM inverter, third harmonics can be eliminated of pulse width is equal to
A) 30° B) 60° C) 120° D) None of these

11) TRIAC cannot be used in
A) AC voltage regulator B) Cycloconverter
C) Solid state type of switch D) Inverter

12) For continuous conduction, in a single phase full converter each pair of SCRs conducts for
A) $(\pi - \alpha)$ radians B) π radians
C) α radians D) $(\pi + \alpha)$ radians

13) In a single phase full converter, if output voltage has peak and average values of 325 V and 133 V respectively, then the firing angle is
A) 40° B) 50° C) 70° D) 130°

14) Chopper control for DC motor provides variation in
A) Input voltage B) Frequency
C) Both A) and B) D) None of the above

15) Which one of the following is the most suitable device for dc-to-dc converter ?
A) BJT B) GTO C) MOSFET D) Thyristor

16) In chopper, the waveforms for input and output voltages are respectively
A) discontinuous, continuous B) continuous, discontinuous
C) both continuous D) both discontinuous

17) A step up chopper has Vs as the source voltage and 'α' as the duty cycle. The output voltage for this chopper is given by
A) Vs. $(1 + \alpha)$ B) $Vs/(1+\alpha)$ C) Vs. $(1 - \alpha)$ D) $Vs/(1-\alpha)$

18) 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

19) The cycloconverter require natural or forced communication as under
A) Natural commutation in both step-up and step down cycloconverter
B) Forced commutation in both step-up and step down cycloconverter
C) Forced commutation in step-up cycloconverter
D) Forced commutation in step-down cycloconverter

20) Induction heating is used for
A) Insulating materials
B) Magnetic materials
C) Conducting materials
D) Both magnetic and non-magnetic materials

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SLR-EP – 147

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 **(4×6=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 : **(2×8=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 : **(4×6=24)**

a) What is cycloconverter ? Explain the operation of 1-ϕ to – 1-ϕ 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 : **(2×8=16)**

a) Write notes :

i) HVDC transmission

iii) Static circuit breakers.

b) Explain the operation of 3-ϕ 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.

SLR-EP – 147

Seat No.	

Set **Q**

T.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2016
INDUSTRIAL ELECTRONICS (Old)

Day and Date : Saturday, 10-12-2016 Total Marks : 100
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) Figures to the **right** indicate **full** marks.*
*4) Assume data, **if** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) In chopper, the waveforms for input and output voltages are respectively
   A) discontinuous, continuous B) continuous, discontinuous
   C) both continuous D) both discontinuous

2) A step up chopper has Vs as the source voltage and 'α' as the duty cycle. The output voltage for this chopper is given by
   A) Vs. $(1 + \alpha)$ B) $Vs/(1+\alpha)$ C) Vs. $(1 - \alpha)$ D) $Vs/(1-\alpha)$

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

4) The cycloconverter require natural or forced communication as under
   A) Natural commutation in both step-up and step down cycloconverter
   B) Forced commutation in both step-up and step down cycloconverter
   C) Forced commutation in step-up cycloconverter
   D) Forced commutation in step-down cycloconverter

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 falls below
   A) Forward current rating B) Breakover voltage
   C) Holding current D) Latching current

7) The object of connecting resistance and capacitance across gate circuit is to protect the thyristor gate against
   A) Overvoltage B) dv/dt
   C) Noise signals D) None of these

P.T.O.

8) An UJT exhibits negative resistance region
   A) Before the break point
   B) Between peak and valley point
   C) After the valley point
   D) Both (A) and (C)

9) The MOSFET combines the areas of _____ and _____
   A) Field effect and MOS technology
   B) Semiconductor and TTL
   C) MOS technology and CMOS technology
   D) None of the mentioned

10) The SCR is a _____ switch.
   A) Two-directional
   B) Uni-directional
   C) Three-directional
   D) Four-directional

11) Thyristor equivalent of thyratron tube is
   A) SCR 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 at same frequency
   D) AC voltage at supply frequency to AC voltage at load frequency

13) A single phase full bridge inverter can operate in load commutation mode in case load consists of
   A) RLC overdamaped
   B) RLC underdamped
   C) RLC critically damped
   D) None of these

14) The ratio of latching current to holding current SCR is
   A) 0.5 B) 1.0 C) 1.5 D) 2.5

15) The single pulse modulation of PWM inverter, third harmonics can be eliminated of pulse width is equal to
   A) 30° B) 60° C) 120° D) None of these

16) TRIAC cannot be used in
   A) AC voltage regulator
   B) Cycloconverter
   C) Solid state type of switch
   D) Inverter

17) For continuous conduction, in a single phase full converter each pair of SCRs conducts for
   A) $(\pi - \alpha)$ radians
   B) π radians
   C) α radians
   D) $(\pi + \alpha)$ radians

18) In a single phase full converter, if output voltage has peak and average values of 325 V and 133 V respectively, then the firing angle is
   A) 40° B) 50° C) 70° D) 130°

19) Chopper control for DC motor provides variation in
   A) Input voltage
   B) Frequency
   C) Both A) and B)
   D) None of the above

20) Which one of the following is the most suitable device for dc-to-dc converter ?
   A) BJT B) GTO C) MOSFET D) Thyristor

_____

SLR-EP – 147

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 **(4×6=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 : **(2×8=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 : **(4×6=24)**

a) What is cycloconverter ? Explain the operation of 1-ϕ to – 1-ϕ 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 : **(2×8=16)**

a) Write notes :

i) HVDC transmission

iii) Static circuit breakers.

b) Explain the operation of 3-ϕ 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.

SLR-EP – 147

Seat No.	

Set **R**

T.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2016
INDUSTRIAL ELECTRONICS (Old)

Day and Date : Saturday, 10-12-2016 Total Marks : 100
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) Figures to the ***right*** *indicate* ***full*** *marks.*
4) Assume data, ***if*** *necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) TRIAC cannot be used in
A) AC voltage regulator B) Cycloconverter
C) Solid state type of switch D) Inverter

2) For continuous conduction, in a single phase full converter each pair of SCRs conducts for
A) $(\pi - \alpha)$ radians B) π radians
C) α radians D) $(\pi + \alpha)$ radians

3) In a single phase full converter, if output voltage has peak and average values of 325 V and 133 V respectively, then the firing angle is
A) 40° B) 50° C) 70° D) 130°

4) Chopper control for DC motor provides variation in
A) Input voltage B) Frequency
C) Both A) and B) D) None of the above

5) Which one of the following is the most suitable device for dc-to-dc converter ?
A) BJT B) GTO C) MOSFET D) Thyristor

6) In chopper, the waveforms for input and output voltages are respectively
A) discontinuous, continuous B) continuous, discontinuous
C) both continuous D) both discontinuous

7) A step up chopper has Vs as the source voltage and 'α' as the duty cycle. The output voltage for this chopper is given by
A) Vs. $(1 + \alpha)$ B) $Vs/(1+\alpha)$ 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

P.T.O.

9) The cycloconverter require natural or forced communication as under
   A) Natural commutation in both step-up and step down cycloconverter
   B) Forced commutation in both step-up and step down cycloconverter
   C) Forced commutation in step-up cycloconverter
   D) Forced commutation in step-down cycloconverter

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 falls below
   A) Forward current rating B) Breakover voltage
   C) Holding current D) Latching current

12) The object of connecting resistance and capacitance across gate circuit is to protect the thyristor gate against
   A) Overvoltage B) dv/dt
   C) Noise signals D) None of these

13) An UJT exhibits negative resistance region
   A) Before the break point B) Between peak and valley point
   C) After the valley point D) Both (A) and (C)

14) The MOSFET combines the areas of _____ and _____
   A) Field effect and MOS technology
   B) Semiconductor and TTL
   C) MOS technology and CMOS technology
   D) None of the mentioned

15) The SCR is a _____ switch.
   A) Two-directional B) Uni-directional
   C) Three-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 at load frequency

18) A single phase full bridge inverter can operate in load commutation mode in case load consists of
   A) RLC overdamaped B) RLC underdamped
   C) RLC critically damped D) None of these

19) The ratio of latching current to holding current SCR is
   A) 0.5 B) 1.0 C) 1.5 D) 2.5

20) The single pulse modulation of PWM inverter, third harmonics can be eliminated of pulse width is equal to
   A) 30° B) 60° C) 120° D) None of these

_____

SLR-EP – 147

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 **(4×6=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 : **(2×8=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 : **(4×6=24)**

a) What is cycloconverter ? Explain the operation of 1-ϕ to – 1-ϕ 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 : **(2×8=16)**

a) Write notes :

i) HVDC transmission

iii) Static circuit breakers.

b) Explain the operation of 3-ϕ 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.

SLR-EP – 147

Seat No.	

Set **S**

T.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2016
INDUSTRIAL ELECTRONICS (Old)

Day and Date : Saturday, 10-12-2016 Total Marks : 100
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) Figures to the **right** indicate **full** marks.*
*4) Assume data, **if** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) Thyristor equivalent of thyratron tube is
A) SCR B) UJT C) Diac D) Triac

2) 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 at load frequency

3) A single phase full bridge inverter can operate in load commutation mode in case load consists of
A) RLC overdamaped B) RLC underdamped
C) RLC critically damped D) None of these

4) The ratio of latching current to holding current SCR is
A) 0.5 B) 1.0 C) 1.5 D) 2.5

5) The single pulse modulation of PWM inverter, third harmonics can be eliminated of pulse width is equal to
A) 30° B) 60° C) 120° D) None of these

6) TRIAC cannot be used in
A) AC voltage regulator B) Cycloconverter
C) Solid state type of switch D) Inverter

7) For continuous conduction, in a single phase full converter each pair of SCRs conducts for
A) $(\pi - \alpha)$ radians B) π radians
C) α radians D) $(\pi + \alpha)$ radians

8) In a single phase full converter, if output voltage has peak and average values of 325 V and 133 V respectively, then the firing angle is
A) 40° B) 50° C) 70° D) 130°

9) Chopper control for DC motor provides variation in
A) Input voltage B) Frequency
C) Both A) and B) D) None of the above

10) Which one of the following is the most suitable device for dc-to-dc converter ?
A) BJT B) GTO C) MOSFET D) Thyristor

P.T.O.

11) In chopper, the waveforms for input and output voltages are respectively
A) discontinuous, continuous B) continuous, discontinuous
C) both continuous D) both discontinuous

12) A step up chopper has Vs as the source voltage and 'α' as the duty cycle. The output voltage for this chopper is given by
A) Vs. $(1 + \alpha)$ B) $Vs/(1+\alpha)$ C) Vs. $(1 - \alpha)$ D) $Vs/(1-\alpha)$

13) 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

14) The cycloconverter require natural or forced communication as under
A) Natural commutation in both step-up and step down cycloconverter
B) Forced commutation in both step-up and step down cycloconverter
C) Forced commutation in step-up cycloconverter
D) Forced commutation in step-down cycloconverter

15) Induction heating is used for
A) Insulating materials
B) Magnetic materials
C) Conducting materials
D) Both magnetic and non-magnetic materials

16) The SCR is turned-off when the anode current falls below
A) Forward current rating B) Breakover voltage
C) Holding current D) Latching current

17) The object of connecting resistance and capacitance across gate circuit is to protect the thyristor gate against
A) Overvoltage B) dv/dt
C) Noise signals D) None of these

18) An UJT exhibits negative resistance region
A) Before the break point B) Between peak and valley point
C) After the valley point D) Both (A) and (C)

19) The MOSFET combines the areas of _____ and _____
A) Field effect and MOS technology
B) Semiconductor and TTL
C) MOS technology and CMOS technology
D) None of the mentioned

20) The SCR is a _____ switch.
A) Two-directional B) Uni-directional
C) Three-directional D) Four-directional

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SLR-EP – 147

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 **(4×6=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 : **(2×8=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 : **(4×6=24)**

a) What is cycloconverter ? Explain the operation of 1-ϕ to – 1-ϕ 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 : **(2×8=16)**

a) Write notes :

i) HVDC transmission

iii) Static circuit breakers.

b) Explain the operation of 3-ϕ 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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SLR-EP – 148

Seat No.	

Set P

B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016
COMPUTER COMMUNICATION NETWORK

Day and Date : Tuesday, 29-11-2016 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 :
   1) When documenting a client's wide area network, you discover that every physical location has a dedicated link to every other physical location. Which of the following wiring topologies does this describe ?
      a) Bus b) Star c) Ring d) Mesh
   2) In the OSI model, which of the following is an application layer services ?
      a) Network virtual terminal
      b) File transfer, access and management
      c) Mail service
      d) All of above
   3) Which of the following OSI layers handles the function process to process communication ?
      a) Session b) Application c) Transport d) Presentation
   4) Number of links to connect n nodes in a mesh topology is =
      a) N(N – 1)/2 b) N(N – 2) c) N d) N^2
   5) The reminder of CRC division at receiver is zero, means
      a) Transmission Error occur b) No transmission Error
      c) Retransmission d) None of the above
   6) _____ Frame does not carry any sequence number in HDLC.
      a) I-Frame b) S-Frame c) U-Frame d) None of the above
   7) In CRS _____ arithmetic is used to carry out the division.
      a) Module 1 b) Module 2 c) Module 3 d) Module 4
   8) IEEE 802.3 uses _____ cable.
      a) 10Base5 b) 10Base2 c) 10baseT d) All above

P.T.O.

9) 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) 255.255.255.256

10) UDP is called a _____ transport protocol.
   a) Connectionless, reliable b) Connectionless, unreliable
   c) Connection-oriented, Unreliable d) None of these

11) Errors in the header or option fields of an IP datagram requires a _____ error message.
   a) Parameter problem b) Source-Quench
   c) Router-Solicitation d) None of these

12) 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

13) IP multicast uses
   a) Class A address b) Class B address
   c) Class C address d) Class D address

14) Which of the following standards used for CSMA/CD LAN ?
   a) IEEE 802.3 b) IEEE 802.2 c) IEEE 802.5 d) IEEE 802.4

15) Problem of mapping IP address to physical address is solved by
   a) ARP b) RARP c) DHCP d) ICMP

16) For early lease termination, DHCP client sends _____ message to the server.
   a) DHCPNACK b) DHCPACK
   c) DHCPRELEASE d) None of these

17) For distribution of link state packets, which of the following method is used ?
   a) Shortest Path b) Flow based
   c) Flooding d) Distance Vector Routing

18) DNS uses caching for
   a) Search mapping b) Name Resolution
   c) Optimizing search cost d) None of these

19) You are given a Class C network with 26 bits for networking. How many subnets do you have ?
   a) 1 b) 2 c) 3 d) 4

20) You are given a Class C network with a subnet mask of 255.255.255.192 how many host addresses are there on each subnet ?
   a) 30 b) 64 c) 126 d) 254

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Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016
COMPUTER COMMUNICATION NETWORK

Day and Date : Tuesday, 29-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four** : **(4×5=20)**

   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** : **(2×10=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 alongwith suitable example CRC method of error detection.

SECTION – II

4. Attempt **any four** : **(4×5=20)**

   a) Write a short note on ARP.

   b) Explain various modes of operations in case of IEEE 802.5 Token Ring Network.

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** : **(2×10=20)**

a) Explain IEEE 802.3 Physical layer specifications.

b) Explain shortest path routing.

c) Draw and explain block schematic of Modem.

SLR-EP – 148

Seat No.	

Set Q

B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016
COMPUTER COMMUNICATION NETWORK

Day and Date : Tuesday, 29-11-2016 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 :
   1) For early lease termination, DHCP client sends _____ message to the server.
      a) DHCPNACK b) DHCPACK
      c) DHCPRELEASE d) None of these
   2) For distribution of link state packets, which of the following method is used ?
      a) Shortest Path b) Flow based
      c) Flooding d) Distance Vector Routing
   3) DNS uses caching for
      a) Search mapping b) Name Resolution
      c) Optimizing search cost d) None of these
   4) You are given a Class C network with 26 bits for networking. How many subnets do you have ?
      a) 1 b) 2 c) 3 d) 4
   5) You are given a Class C network with a subnet mask of 255.255.255.192 how many host addresses are there on each subnet ?
      a) 30 b) 64 c) 126 d) 254
   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 of the following wiring topologies does this describe ?
      a) Bus b) Star c) Ring d) Mesh

7) In the OSI model, which of the following is an application layer services ?
   a) Network virtual terminal
   b) File transfer, access and management
   c) Mail service
   d) All of above

8) Which of the following OSI layers handles the function process to process communication ?
   a) Session b) Application c) Transport d) Presentation

9) Number of links to connect n nodes in a mesh topology is =
   a) N(N – 1)/2 b) N(N – 2) c) N d) N^2

10) The reminder of CRC division at receiver is zero, means
   a) Transmission Error occur b) No transmission Error
   c) Retransmission d) None of the above

11) _____ Frame does not carry any sequence number in HDLC.
   a) I-Frame b) S-Frame c) U-Frame d) None of the above

12) In CRS _____ arithmetic is used to carry out the division.
   a) Module 1 b) Module 2 c) Module 3 d) Module 4

13) IEEE 802.3 uses _____ cable.
   a) 10Base5 b) 10Base2 c) 10baseT d) All above

14) 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) 255.255.255.256

15) UDP is called a _____ transport protocol.
   a) Connectionless, reliable b) Connectionless, unreliable
   c) Connection-oriented, Unreliable d) None of these

16) Errors in the header or option fields of an IP datagram requires a _____ error message.
   a) Parameter problem b) Source-Quench
   c) Router-Solicitation d) None of these

17) 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

18) IP multicast uses
   a) Class A address b) Class B address
   c) Class C address d) Class D address

19) Which of the following standards used for CSMA/CD LAN ?
   a) IEEE 802.3 b) IEEE 802.2 c) IEEE 802.5 d) IEEE 802.4

20) Problem of mapping IP address to physical address is solved by
   a) ARP b) RARP c) DHCP d) ICMP

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Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016
COMPUTER COMMUNICATION NETWORK

Day and Date : Tuesday, 29-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four** : **(4×5=20)**

   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** : **(2×10=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 alongwith suitable example CRC method of error detection.

SECTION – II

4. Attempt **any four** : **(4×5=20)**

   a) Write a short note on ARP.

   b) Explain various modes of operations in case of IEEE 802.5 Token Ring Network.

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** : **(2×10=20)**

a) Explain IEEE 802.3 Physical layer specifications.

b) Explain shortest path routing.

c) Draw and explain block schematic of Modem.

SLR-EP – 148

Seat No.	

Set R

B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016
COMPUTER COMMUNICATION NETWORK

Day and Date : Tuesday, 29-11-2016 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 :
   1) Errors in the header or option fields of an IP datagram requires a _____ error message.
      a) Parameter problem b) Source-Quench
      c) Router-Solicitation d) None of these
   2) 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
   3) IP multicast uses
      a) Class A address b) Class B address
      c) Class C address d) Class D address
   4) Which of the following standards used for CSMA/CD LAN ?
      a) IEEE 802.3 b) IEEE 802.2 c) IEEE 802.5 d) IEEE 802.4
   5) Problem of mapping IP address to physical address is solved by
      a) ARP b) RARP c) DHCP d) ICMP
   6) For early lease termination, DHCP client sends _____ message to the server.
      a) DHCPNACK b) DHCPACK
      c) DHCPRELEASE d) None of these
   7) For distribution of link state packets, which of the following method is used ?
      a) Shortest Path b) Flow based
      c) Flooding d) Distance Vector Routing

8) DNS uses caching for
   a) Search mapping b) Name Resolution
   c) Optimizing search cost d) None of these

9) You are given a Class C network with 26 bits for networking. How many subnets do you have ?
   a) 1 b) 2 c) 3 d) 4

10) You are given a Class C network with a subnet mask of 255.255.255.192 how many host addresses are there on each subnet ?
   a) 30 b) 64 c) 126 d) 254

11) When documenting a client's wide area network, you discover that every physical location has a dedicated link to every other physical location. Which of the following wiring topologies does this describe ?
   a) Bus b) Star c) Ring d) Mesh

12) In the OSI model, which of the following is an application layer services ?
   a) Network virtual terminal
   b) File transfer, access and management
   c) Mail service
   d) All of above

13) Which of the following OSI layers handles the function process to process communication ?
   a) Session b) Application c) Transport d) Presentation

14) Number of links to connect n nodes in a mesh topology is =
   a) $N(N-1)/2$ b) $N(N-2)$ c) N d) N^2

15) The reminder of CRC division at receiver is zero, means
   a) Transmission Error occur b) No transmission Error
   c) Retransmission d) None of the above

16) _____ Frame does not carry any sequence number in HDLC.
   a) I-Frame b) S-Frame c) U-Frame d) None of the above

17) In CRS _____ arithmetic is used to carry out the division.
   a) Module 1 b) Module 2 c) Module 3 d) Module 4

18) IEEE 802.3 uses _____ cable.
   a) 10Base5 b) 10Base2 c) 10baseT d) All above

19) 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) 255.255.255.256

20) UDP is called a _____ transport protocol.
   a) Connectionless, reliable b) Connectionless, unreliable
   c) Connection-oriented, Unreliable d) None of these

_____

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Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016
COMPUTER COMMUNICATION NETWORK

Day and Date : Tuesday, 29-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four** : **(4×5=20)**

   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** : **(2×10=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 alongwith suitable example CRC method of error detection.

SECTION – II

4. Attempt **any four** : **(4×5=20)**

   a) Write a short note on ARP.

   b) Explain various modes of operations in case of IEEE 802.5 Token Ring Network.

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** : **(2×10=20)**

a) Explain IEEE 802.3 Physical layer specifications.

b) Explain shortest path routing.

c) Draw and explain block schematic of Modem.

SLR-EP – 148

Seat No.	

Set **S**

B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016
COMPUTER COMMUNICATION NETWORK

Day and Date : Tuesday, 29-11-2016 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 :
   1) _____ Frame does not carry any sequence number in HDLC.
      a) I-Frame b) S-Frame c) U-Frame d) None of the above
   2) In CRS _____ arithmetic is used to carry out the division.
      a) Module 1 b) Module 2 c) Module 3 d) Module 4
   3) IEEE 802.3 uses _____ cable.
      a) 10Base5 b) 10Base2 c) 10baseT 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) 255.255.255.256
   5) UDP is called a _____ transport protocol.
      a) Connectionless, reliable b) Connectionless, unreliable
      c) Connection-oriented, Unreliable d) None of these
   6) Errors in the header or option fields of an IP datagram requires a _____ error message.
      a) Parameter problem b) Source-Quench
      c) Router-Solicitation d) None of these
   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
      c) Class C address d) Class D address

P.T.O.

9) Which of the following standards used for CSMA/CD LAN ?
   a) IEEE 802.3 b) IEEE 802.2 c) IEEE 802.5 d) IEEE 802.4

10) Problem of mapping IP address to physical address is solved by
   a) ARP b) RARP c) DHCP d) ICMP

11) For early lease termination, DHCP client sends _____ message to the server.
   a) DHCPNACK b) DHCPACK
   c) DHCPRELEASE d) None of these

12) For distribution of link state packets, which of the following method is used ?
   a) Shortest Path b) Flow based
   c) Flooding d) Distance Vector Routing

13) DNS uses caching for
   a) Search mapping b) Name Resolution
   c) Optimizing search cost d) None of these

14) You are given a Class C network with 26 bits for networking. How many subnets do you have ?
   a) 1 b) 2 c) 3 d) 4

15) You are given a Class C network with a subnet mask of 255.255.255.192 how many host addresses are there on each subnet ?
   a) 30 b) 64 c) 126 d) 254

16) When documenting a client's wide area network, you discover that every physical location has a dedicated link to every other physical location. Which of the following wiring topologies does this describe ?
   a) Bus b) Star c) Ring d) Mesh

17) In the OSI model, which of the following is an application layer services ?
   a) Network virtual terminal
   b) File transfer, access and management
   c) Mail service
   d) All of above

18) Which of the following OSI layers handles the function process to process communication ?
   a) Session b) Application c) Transport d) Presentation

19) Number of links to connect n nodes in a mesh topology is =
   a) $N(N-1)/2$ b) $N(N-2)$ c) N d) N^2

20) The reminder of CRC division at receiver is zero, means
   a) Transmission Error occur b) No transmission Error
   c) Retransmission d) None of the above

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SLR-EP – 148

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016
COMPUTER COMMUNICATION NETWORK

Day and Date : Tuesday, 29-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four** : **(4×5=20)**

   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** : **(2×10=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 alongwith suitable example CRC method of error detection.

SECTION – II

4. Attempt **any four** : **(4×5=20)**

   a) Write a short note on ARP.

   b) Explain various modes of operations in case of IEEE 802.5 Token Ring Network.

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** : **(2×10=20)**

a) Explain IEEE 802.3 Physical layer specifications.

b) Explain shortest path routing.

c) Draw and explain block schematic of Modem.

SLR-EP – 149

Seat No.	

Set P

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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(1×20=20)**

1) Under steady state condition power dissipated in CMOS circuit is
a) 0 W b) 10 μ W c) 0.1 μ W d) None

2) The symbol _____ is the signal assignment operator.
a) := b) <=
c) => d) None of above

3) Transmission Gate in CMOS also called as
a) Pass Gate b) Pull – up gate
c) Fail Gate d) Pull – down gate

4) The block of code which defines the relationship between input, output and internal signal or variable in VHDL
a) Architecture b) Entity c) Package d) Library

5) To implement 5 input NOR gate using CMOS logic requires _____ numbers of MOSFETs.
a) 6 b) 8 c) 10 d) 4

6) _____ is not a concurrent statement.
a) Generate b) When else
c) If – then d) With – Select – when

7) The problem of a clock skew occurs in
a) Gates b) Sequential circuit
c) Combinational circuits d) None

P.T.O.

8) When an iterative array of identical components is required, the _____ statement provides an easy way of instantiating these components.
   a) Port map b) For loop c) For Generate d) None

9) A process cannot have
   a) Wait statement b) Wait statement and sensitivity list
   c) Sensitivity list d) None

10) CLK'1 is an attribute type
   a) EVENT b) Delay c) Stable d) None

11) The behaviour of sequential circuit is described in tabular format called
   a) State table b) Truth table c) State diagram d) Both a) and b)

12) Built in self test contains
   a) Shift register b) Linear feedback shift register
   c) Compressor circuit d) Both b) and c)

13) Logic block of FPGA contains
   a) Macrocell b) Look-up table
   c) Both a) and b) d) None

14) Stuck-at 0 and stuck-at 1 faults causes due to
   a) Short circuit fault b) Open circuit fault
   c) Short and open circuit fault d) None

15) Logic within the functional block of CPLD is implemented using
   a) Product-of-some b) Sum-of-product
   c) Both a) and b) d) None

16) Macrocell of CPLD can implement _____ function.
   a) Combinatorial b) Sequential/registered
   c) Both a) and b) d) None

17) Boundary Scan technique consists of
   a) Scan path testing port b) Test access port
   c) Both a) and b) d) None

18) To detect N bit sequence using Moore machine, the number of states required
   a) 2 N b) N + 1 c) N – 1 d) 2 N – 1

19) A PLA has a
   a) programmable AND b) programmable AND and OR
   c) a) and b) both d) none of the above

20) The macrocell register can be configured as _____ flip flop.
   a) D b) T c) D and T d) D or T

_____

SLR-EP – 149

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** : **(4×4=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** : **(8×3=24)**

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.

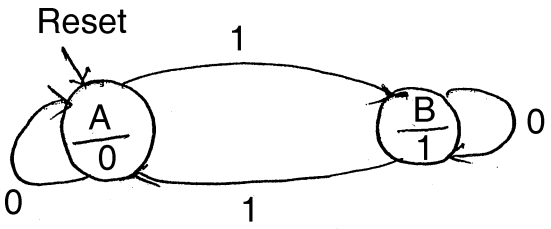
c) Explain in detail VHDL Subprogram.

d) Write VHDL code for 16 : 1 multiplexer using structural modeling.

SECTION – II

4. Solve **any four** : **(4×4=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** : **(8×3=24)**

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.

SLR-EP – 149

Seat No.	

Set Q

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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(1×20=20)**

1) Macrocell of CPLD can implement _____ function.
   a) Combinatorial b) Sequential/registered
   c) Both a) and b) d) None

2) Boundary Scan technique consists of
   a) Scan path testing port b) Test access port
   c) Both a) and b) d) None

3) To detect N bit sequence using Moore machine, the number of states required
   a) 2 N b) N + 1 c) N – 1 d) 2 N – 1

4) A PLA has a
   a) programmable AND b) programmable AND and OR
   c) a) and b) both d) none of the above

5) The macrocell register can be configured as _____ flip flop.
   a) D b) T c) D and T d) D or T

6) Under steady state condition power dissipated in CMOS circuit is
   a) 0 W b) 10 μ W c) 0.1 μ W d) None

7) The symbol _____ is the signal assignment operator.
   a) := b) <=
   c) => d) None of above

8) Transmission Gate in CMOS also called as
   a) Pass Gate b) Pull – up gate
   c) Fail Gate d) Pull – down gate

9) The block of code which defines the relationship between input, output and internal signal or variable in VHDL
   a) Architecture b) Entity c) Package d) Library

10) To implement 5 input NOR gate using CMOS logic requires _____ numbers of MOSFETs.
   a) 6 b) 8 c) 10 d) 4

11) _____ is not a concurrent statement.
   a) Generate b) When else
   c) If – then d) With – Select – when

12) The problem of a clock skew occurs in
   a) Gates b) Sequential circuit
   c) Combinational circuits d) None

13) When an iterative array of identical components is required, the _____ statement provides an easy way of instantiating these components.
   a) Port map b) For loop c) For Generate d) None

14) A process cannot have
   a) Wait statement b) Wait statement and sensitivity list
   c) Sensitivity list d) None

15) CLK'1 is an attribute type
   a) EVENT b) Delay c) Stable d) None

16) The behaviour of sequential circuit is described in tabular format called
   a) State table b) Truth table c) State diagram d) Both a) and b)

17) Built in self test contains
   a) Shift register b) Linear feedback shift register
   c) Compressor circuit d) Both b) and c)

18) Logic block of FPGA contains
   a) Macrocell b) Look-up table
   c) Both a) and b) d) None

19) Stuck-at 0 and stuck-at 1 faults causes due to
   a) Short circuit fault b) Open circuit fault
   c) Short and open circuit fault d) None

20) Logic within the functional block of CPLD is implemented using
   a) Product-of-some b) Sum-of-product
   c) Both a) and b) d) None

_____

SLR-EP – 149

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** : **(4×4=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** : **(8×3=24)**

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.

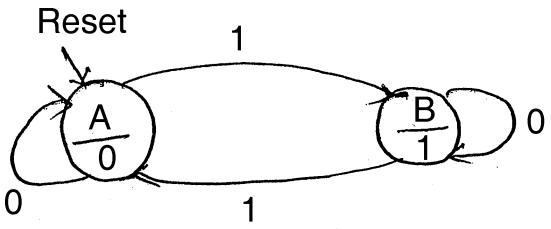
c) Explain in detail VHDL Subprogram.

d) Write VHDL code for 16 : 1 multiplexer using structural modeling.

SECTION – II

4. Solve **any four** : **(4×4=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** : **(8×3=24)**

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.

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SLR-EP – 149

Seat No.	

Set R

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.*
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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 : 20

1. Choose the correct answer : **(1×20=20)**

1) The behaviour of sequential circuit is described in tabular format called
   a) State table b) Truth table c) State diagram d) Both a) and b)

2) Built in self test contains
   a) Shift register b) Linear feedback shift register
   c) Compressor circuit d) Both b) and c)

3) Logic block of FPGA contains
   a) Macrocell b) Look-up table
   c) Both a) and b) d) None

4) Stuck-at 0 and stuck-at 1 faults causes due to
   a) Short circuit fault b) Open circuit fault
   c) Short and open circuit fault d) None

5) Logic within the functional block of CPLD is implemented using
   a) Product-of-some b) Sum-of-product
   c) Both a) and b) d) None

6) Macrocell of CPLD can implement _____ function.
   a) Combinatorial b) Sequential/registered
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7) Boundary Scan technique consists of
   a) Scan path testing port b) Test access port
   c) Both a) and b) d) None

P.T.O.

8) To detect N bit sequence using Moore machine, the number of states required
   a) 2 N b) N + 1 c) N – 1 d) 2 N – 1

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10) The macrocell register can be configured as _____ flip flop.
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   a) 0 W b) 10 μ W c) 0.1 μ W d) None

12) The symbol _____ is the signal assignment operator.
   a) := b) <=
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13) Transmission Gate in CMOS also called as
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14) The block of code which defines the relationship between input, output and internal signal or variable in VHDL
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15) To implement 5 input NOR gate using CMOS logic requires _____ numbers of MOSFETs.
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16) _____ is not a concurrent statement.
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_____

SLR-EP – 149

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****.*

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SECTION – I

2. Solve **any four** : **(4×4=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** : **(8×3=24)**

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.

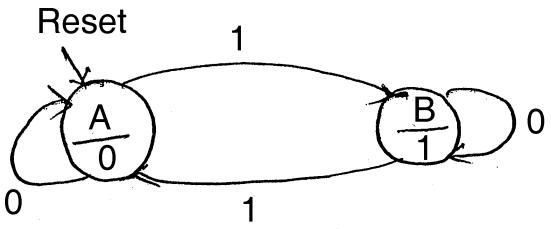
c) Explain in detail VHDL Subprogram.

d) Write VHDL code for 16 : 1 multiplexer using structural modeling.

SECTION – II

4. Solve **any four** : **(4×4=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** : **(8×3=24)**

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.

SLR-EP – 149

Seat No.	

Set S

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****.*
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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 Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(1×20=20)**

1) _____ is not a concurrent statement.
   a) Generate b) When else
   c) If – then d) With – Select – when

2) The problem of a clock skew occurs in
   a) Gates b) Sequential circuit
   c) Combinational circuits d) None

3) When an iterative array of identical components is required, the _____ statement provides an easy way of instantiating these components.
   a) Port map b) For loop c) For Generate d) None

4) A process cannot have
   a) Wait statement b) Wait statement and sensitivity list
   c) Sensitivity list d) None

5) CLK'1 is an attribute type
   a) EVENT b) Delay c) Stable d) None

6) The behaviour of sequential circuit is described in tabular format called
   a) State table b) Truth table c) State diagram d) Both a) and b)

7) Built in self test contains
   a) Shift register b) Linear feedback shift register
   c) Compressor circuit d) Both b) and c)

P.T.O.

8) Logic block of FPGA contains
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14) A PLA has a
   a) programmable AND b) programmable AND and OR
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15) The macrocell register can be configured as _____ flip flop.
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16) Under steady state condition power dissipated in CMOS circuit is
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17) The symbol _____ is the signal assignment operator.
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18) Transmission Gate in CMOS also called as
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19) The block of code which defines the relationship between input, output and internal signal or variable in VHDL
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20) To implement 5 input NOR gate using CMOS logic requires _____ numbers of MOSFETs.
   a) 6 b) 8 c) 10 d) 4

_____

SLR-EP – 149

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** : **(4×4=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** : **(8×3=24)**

a) Implement the function using CMOS logic :

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b) Explain Operator overloading with example.

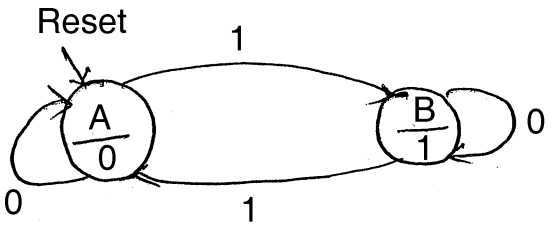
c) Explain in detail VHDL Subprogram.

d) Write VHDL code for 16 : 1 multiplexer using structural modeling.

SECTION – II

4. Solve **any four** : **(4×4=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** : **(8×3=24)**

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.

SLR-EP – 150

Seat No.	

Set P

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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) _____ is based on a principle of trilateration.
a) Teledesic b) GPS c) Iridium d) VSAT

2) What is the bandwidth of Communication Satellite ?
a) 8 – 16 GHz b) 4 – 6 GHz c) 500 MHz d) 1 – 2 GHz

3) 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) $m \times (v/r)$

4) Kepler's first law of planetary motion.
a) Orbit of any smaller body about a larger body is always an ellipse
b) Orbit of any smaller body about a larger body is always a circular
c) The orbit of the smaller body sweeps out equal area in equal time
d) None of above

5) The right ascension of the ascending node is called
a) ω b) Ω c) i d) μ

6) The satellite moves upward through the equatorial plane at the
a) Ascending node b) Descending node
c) Inclination d) Right ascension

7) At the Greenwich Meridian the line drawn from the
a) East to West b) Equator
c) North to South Pole d) None of the above

8) Latitude is the angular distance measured in degrees form
   a) North Pole b) South Pole
   c) Equator d) None of the above
9) The Doppler shift is negligible for
   a) GEO b) MEO c) LEO d) Polar Satellite
10) Eclipse occurs during two period per year, that is _____ days before equinoxes.
   a) 21 b) 22 c) 23 d) 24
11) The gravitational pull on the satellite due to Sun and Moon tends to change the inclination of the satellite's orbit _____ per year.
   a) 75° E b) 105° W c) 0.86° d) 165° E
12) At the equator there are bulges of about _____ at longitudes 162° E and 348° E.
   a) 65 m b) 75 m
   c) 55 m d) None of the above
13) In LEO satellite _____ is having large coverage area.
   a) Equatorial b) Inclined
   c) Molniya d) None of the above
14) Apogee of the molniya satellite at an altitude of
   a) 39152 km b) 35786 km c) 20200 km d) 500 km
15) Perigee of the molniya satellite at an altitude of
   a) 39152 km b) 35786 km c) 20200 km d) 500 km
16) Two molniya orbits plans separated by
   a) 90° b) 180° c) 0° d) 360°
17) Sun synchronous orbit maintains a constant angle with the direction of
   a) Earth b) Sun
   c) Moon d) Sub satellite point
18) GPS space segment consist of _____ satellites in MEO.
   a) 24 b) 22 c) 20 d) 18
19) GPS satellite constellation separated by _____ in longitude.
   a) 60° b) 30° c) 120° d) 180°
20) In GPS which code having high accuracy ?
   a) C/A b) P
   c) Both a) and b) d) None of the above

_____

SLR-EP – 150

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** : **(4×4=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^2.

3. Solve **any three** : **(3×8=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** : **(4×4=16)**
   1) Explain in detail molniya 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** : **(3×8=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

Set P

SLR-EP – 150

Seat No.	

Set Q

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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) Two molniya orbits plans separated by
a) 90° b) 180° c) 0° d) 360°

2) Sun synchronous orbit maintains a constant angle with the direction of
a) Earth b) Sun
c) Moon d) Sub satellite point

3) GPS space segment consist of _____ satellites in MEO.
a) 24 b) 22 c) 20 d) 18

4) GPS satellite constellation separated by _____ in longitude.
a) 60° b) 30° c) 120° d) 180°

5) In GPS which code having high accuracy ?
a) C/A b) P
c) Both a) and b) d) None of the above

6) _____ is based on a principle of trilateration.
a) Teledesic b) GPS c) Iridium d) VSAT

7) What is the bandwidth of Communication Satellite ?
a) 8 – 16 GHz b) 4 – 6 GHz c) 500 MHz d) 1 – 2 GHz

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) $m \times (v/r)$

P.T.O.

9) Kepler's first law of planetary motion.
   a) Orbit of any smaller body about a larger body is always an ellipse
   b) Orbit of any smaller body about a larger body is always a circular
   c) The orbit of the smaller body sweeps out equal area in equal time
   d) None of above

10) The right ascension of the ascending node is called
   a) ω b) Ω c) i d) μ

11) The satellite moves upward through the equatorial plane at the
   a) Ascending node b) Descending node
   c) Inclination d) Right ascension

12) At the Greenwich Meridian the line drawn from the
   a) East to West b) Equator
   c) North to South Pole d) None of the above

13) Latitude is the angular distance measured in degrees form
   a) North Pole b) South Pole
   c) Equator d) None of the above

14) The Doppler shift is negligible for
   a) GEO b) MEO c) LEO d) Polar Satellite

15) Eclipse occurs during two period per year, that is _____ days before equinoxes.
   a) 21 b) 22 c) 23 d) 24

16) The gravitational pull on the satellite due to Sun and Moon tends to change the inclination of the satellite's orbit _____ per year.
   a) 75° E b) 105° W c) 0.86° d) 165° E

17) At the equator there are bulges of about _____ at longitudes 162° E and 348° E.
   a) 65 m b) 75 m
   c) 55 m d) None of the above

18) In LEO satellite _____ is having large coverage area.
   a) Equatorial b) Inclined
   c) Molniya d) None of the above

19) Apogee of the molniya satellite at an altitude of
   a) 39152 km b) 35786 km c) 20200 km d) 500 km

20) Perigee of the molniya satellite at an altitude of
   a) 39152 km b) 35786 km c) 20200 km d) 500 km

_____

SLR-EP – 150

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** : **(4×4=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^2.

3. Solve **any three** : **(3×8=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** : **(4×4=16)**
   1) Explain in detail molniya 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** : **(3×8=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

Set Q

SLR-EP – 150

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****.*
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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 : **(20×1=20)**

1) The gravitational pull on the satellite due to Sun and Moon tends to change the inclination of the satellite's orbit _____ per year.
a) 75° E b) 105° W c) 0.86° d) 165° E

2) At the equator there are bulges of about _____ at longitudes 162° E and 348° E.
a) 65 m b) 75 m
c) 55 m d) None of the above

3) In LEO satellite _____ is having large coverage area.
a) Equatorial b) Inclined
c) Molniya d) None of the above

4) Apogee of the molniya satellite at an altitude of
a) 39152 km b) 35786 km c) 20200 km d) 500 km

5) Perigee of the molniya satellite at an altitude of
a) 39152 km b) 35786 km c) 20200 km d) 500 km

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a) 90° b) 180° c) 0° d) 360°

7) Sun synchronous orbit maintains a constant angle with the direction of
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c) Moon d) Sub satellite point

P.T.O.

8) GPS space segment consist of _____ satellites in MEO.
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   c) Both a) and b) d) None of the above
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12) What is the bandwidth of Communication Satellite ?
   a) 8 – 16 GHz b) 4 – 6 GHz c) 500 MHz d) 1 – 2 GHz
13) 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) $m \times (v/r)$
14) Kepler's first law of planetary motion.
   a) Orbit of any smaller body about a larger body is always an ellipse
   b) Orbit of any smaller body about a larger body is always a circular
   c) The orbit of the smaller body sweeps out equal area in equal time
   d) None of above
15) The right ascension of the ascending node is called
   a) ω b) Ω c) i d) μ
16) The satellite moves upward through the equatorial plane at the
   a) Ascending node b) Descending node
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17) At the Greenwich Meridian the line drawn from the
   a) East to West b) Equator
   c) North to South Pole d) None of the above
18) Latitude is the angular distance measured in degrees form
   a) North Pole b) South Pole
   c) Equator d) None of the above
19) The Doppler shift is negligible for
   a) GEO b) MEO c) LEO d) Polar Satellite
20) Eclipse occurs during two period per year, that is _____ days before equinoxes.
   a) 21 b) 22 c) 23 d) 24

_____

SLR-EP – 150

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****.*
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SECTION – I

2. Solve **any four** : **(4×4=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^2.

3. Solve **any three** : **(3×8=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** : **(4×4=16)**
   1) Explain in detail molniya 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** : **(3×8=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

Set R

SLR-EP – 150

Seat No.	

Set S

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****.*
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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 : **(20×1=20)**

1) The satellite moves upward through the equatorial plane at the
   a) Ascending node b) Descending node
   c) Inclination d) Right ascension

2) At the Greenwich Meridian the line drawn from the
   a) East to West b) Equator
   c) North to South Pole d) None of the above

3) Latitude is the angular distance measured in degrees form
   a) North Pole b) South Pole
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4) The Doppler shift is negligible for
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   a) 75° E b) 105° W c) 0.86° d) 165° E

7) At the equator there are bulges of about _____ at longitudes 162° E and 348° E.
   a) 65 m b) 75 m
   c) 55 m d) None of the above

P.T.O.

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16) _____ is based on a principle of trilateration.
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19) Kepler's first law of planetary motion.
   a) Orbit of any smaller body about a larger body is always an ellipse
   b) Orbit of any smaller body about a larger body is always a circular
   c) The orbit of the smaller body sweeps out equal area in equal time
   d) None of above
20) The right ascension of the ascending node is called
   a) ω b) Ω c) i d) μ

_____

SLR-EP – 150

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** : **(4×4=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^2.

3. Solve **any three** : **(3×8=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** : **(4×4=16)**
   1) Explain in detail molniya 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** : **(3×8=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

Set S

SLR-EP – 151

Seat No.	

Set **P**

B.E. (E and TC) (Part – I) Examination, 2016
CODING THEORY

Day and Date : Tuesday, 6-12-2016 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **20**

1) For a code rate 2/3, transition from each state in state diagram of convolutional code are
   a) 2 b) 4
   c) data is insufficient d) none of these

2) Free distance of non-systematic convolutional code is _____ than that of systematic convolutional code for same code rate.
   a) More b) Less c) Equal d) None of these

3) No. of disjoint cells required to implement decoder for convolutional codes are
   a) 2^{k-1} b) 2^{k-2} c) 2^{k} d) None of these

4) The exponent of D in transfer function gives
   a) Free distance b) No. of decoded one bit
   c) No. of decoded zero bit d) Length of the path

5) The parity check matrix of (n, k) block code is of the order of
   a) $n \times k$ b) $k \times n$ c) $(n - k) \times n$ d) $k \times (n - k)$

6) Generator matrix is used for
   a) Encoding b) Decoding
   c) Standard array d) None of these

7) In a standard array number of coset leaders in (5, 2) code are _____
   a) 5 b) 2 c) 3 d) 8

8) Check which of the following is Hamming code.
   a) (7, 4) b) (7, 3) c) (6, 3) d) (8, 2)

9) For a generator polynomial $g(x) = 1 + x + x^3$. The cyclic code for this polynomial is
   a) (7, 4) b) (8, 5) c) (7, 3) d) (6, 3)

10) If a valid codeword in non-systematic cyclic code is 1101. Which of the following is also a valid codeword ?
a) 0000 b) 1011 c) 0110 d) 1001

11) A turbo code
a) is concatenated code b) uses interleaver
c) uses iterating decoding d) all of these

12) Non-systematic convolutional encoder is
a) FIR system b) IIR system c) Both d) None of these

13) For convolutional code, $g_1 = 111$ and $g_2 = 101$. The code rate and constraint length of this encoder is
a) 1/2, 3 b) 1/3, 2 c) 1/2, 2 d) 1/3, 3

14) The total area under probability distribution curve is
a) 0 b) 1
c) depends on distribution d) none of these

15) Let A and B be two events. If $P(A) = \frac{3}{4}, P(B) = \frac{1}{2}, P(A \cup B) = 1$ and $P(A \cap B) = \frac{1}{4}$, then the conditional probability of B given A is
a) $\frac{1}{3}$ b) $\frac{3}{4}$ c) $\frac{1}{2}$ d) $\frac{1}{4}$

16) Two fair six-sided die are rolled and the face values are added. The probability of obtaining an even number greater than 9 is
a) $\frac{1}{6}$ b) $\frac{2}{9}$ c) $\frac{1}{9}$ d) $\frac{1}{18}$

17) Find the constant C so that

$f(x) = C(x-2)$ for $1 < x < 4$

$= 0$ otherwise

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

18) Calculated _____ is added to received vector to obtain valid code vector.
a) Syndrome b) Error pattern c) a) or b) d) None of these

19) In block coding, if k = 5 and n = 8, we have _____ k tuples.
a) 13 b) 32 c) 4096 d) 64

20) Viterbi decoding algorithm can be implemented using _____ computation.
a) Add-compare-select b) Compare-add-select
c) Add-select-compare d) Compare-select-add

_____

SLR-EP – 151

Seat No.	

B.E. (E and TC) (Part – I) Examination, 2016
CODING THEORY

Day and Date : Tuesday, 6-12-2016 Marks : 80
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**

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.

$$f_x(x) = k.x \quad 0 \le x \le 1$$
$$= k \quad 1 \le x \le 2$$
$$= k(3 - x) \quad 2 \le x \le 3$$

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.

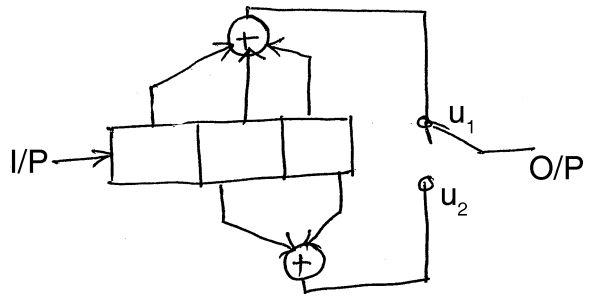
c) Define :

i) Coding gain

ii) Catastrophic error propagation.

d) Explain in brief Turbo encoder.

B) For the given convolutional encoder. **8**



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 $g_2 = 101$: **10**

i) Draw encoder trellis diagram.

ii) Draw decoder trellis diagram.

iii) Find encoded output for input message 1010 from trellis diagram.

Set P

SLR-EP – 151

Seat No.	

Set **Q**

B.E. (E and TC) (Part – I) Examination, 2016
CODING THEORY

Day and Date : Tuesday, 6-12-2016 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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a) $\frac{1}{6}$ b) $\frac{2}{9}$ c) $\frac{1}{9}$ d) $\frac{1}{18}$

2) Find the constant 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) Calculated _____ is added to received vector to obtain valid code vector.
a) Syndrome b) Error pattern c) a) or b) d) None of these

4) In block coding, if k = 5 and n = 8, we have _____ k tuples.
a) 13 b) 32 c) 4096 d) 64

5) Viterbi decoding algorithm can be implemented using _____ computation.
a) Add-compare-select b) Compare-add-select
c) Add-select-compare d) Compare-select-add

6) For a code rate 2/3, transition from each state in state diagram of convolutional code are
a) 2 b) 4
c) data is insufficient d) none of these

7) Free distance of non-systematic convolutional code is _____ than that of systematic convolutional code for same code rate.
a) More b) Less c) Equal d) None of these

P.T.O.

8) No. of disjoint cells required to implement decoder for convolutional codes are
   a) 2^{k-1} b) 2^{k-2} c) 2^{k} d) None of these

9) The exponent of D in transfer function gives
   a) Free distance b) No. of decoded one bit
   c) No. of decoded zero bit d) Length of the path

10) The parity check matrix of (n, k) block code is of the order of
   a) $n \times k$ b) $k \times n$ c) $(n - k) \times n$ d) $k \times (n - k)$

11) Generator matrix is used for
   a) Encoding b) Decoding
   c) Standard array d) None of these

12) In a standard array number of coset leaders in (5, 2) code are _____
   a) 5 b) 2 c) 3 d) 8

13) Check which of the following is Hamming code.
   a) (7, 4) b) (7, 3) c) (6, 3) d) (8, 2)

14) For a generator polynomial $g(x) = 1 + x + x^3$. The cyclic code for this polynomial is
   a) (7, 4) b) (8, 5) c) (7, 3) d) (6, 3)

15) If a valid codeword in non-systematic cyclic code is 1101. Which of the following is also a valid codeword ?
   a) 0000 b) 1011 c) 0110 d) 1001

16) A turbo code
   a) is concatenated code b) uses interleaver
   c) uses iterating decoding d) all of these

17) Non-systematic convolutional encoder is
   a) FIR system b) IIR system c) Both d) None of these

18) For convolutional code, $g_1 = 111$ and $g_2 = 101$. The code rate and constraint length of this encoder is
   a) 1/2, 3 b) 1/3, 2 c) 1/2, 2 d) 1/3, 3

19) The total area under probability distribution curve is
   a) 0 b) 1
   c) depends on distribution d) none of these

20) Let A and B be two events. If $P(A) = \frac{3}{4}, P(B) = \frac{1}{2}, P(A \cup B) = 1$ and $P(A \cap B) = \frac{1}{4}$, then the conditional probability of B given A is
   a) $\frac{1}{3}$ b) $\frac{3}{4}$ c) $\frac{1}{2}$ d) $\frac{1}{4}$

_____

SLR-EP – 151

Seat No.	

B.E. (E and TC) (Part – I) Examination, 2016
CODING THEORY

Day and Date : Tuesday, 6-12-2016 Marks : 80
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**

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 Q

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.

$$f_x(x) = k.x \qquad 0 \le x \le 1$$
$$= k \qquad 1 \le x \le 2$$
$$= k(3 - x) \qquad 2 \le x \le 3$$

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.

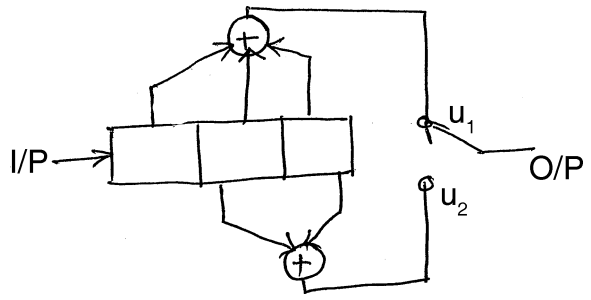
c) Define :

i) Coding gain

ii) Catastrophic error propagation.

d) Explain in brief Turbo encoder.

B) For the given convolutional encoder. **8**



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 $g_2 = 101$: **10**

i) Draw encoder trellis diagram.

ii) Draw decoder trellis diagram.

iii) Find encoded output for input message 1010 from trellis diagram.

Set Q

SLR-EP – 151

Seat No.	

Set **R**

B.E. (E and TC) (Part – I) Examination, 2016
CODING THEORY

Day and Date : Tuesday, 6-12-2016 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **20**

1) A turbo code
   a) is concatenated code b) uses interleaver
   c) uses iterating decoding d) all of these

2) Non-systematic convolutional encoder is
   a) FIR system b) IIR system c) Both d) None of these

3) For convolutional code, $g_1 = 111$ and $g_2 = 101$. The code rate and constraint length of this encoder is
   a) 1/2, 3 b) 1/3, 2 c) 1/2, 2 d) 1/3, 3

4) The total area under probability distribution curve is
   a) 0
   b) 1
   c) depends on distribution
   d) none of these

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 $P(A \cap B) = \frac{1}{4}$, then the conditional probability of B given A is
   a) $\frac{1}{3}$ b) $\frac{3}{4}$ c) $\frac{1}{2}$ d) $\frac{1}{4}$

6) Two fair six-sided die are rolled and the face values are added. The probability of obtaining an even number greater than 9 is
   a) $\frac{1}{6}$ b) $\frac{2}{9}$ c) $\frac{1}{9}$ d) $\frac{1}{18}$

P.T.O.

7) Find the constant C so that

$f(x) = C(x-2)$ for $1 < x < 4$

$= 0$ otherwise

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

8) Calculated _____ is added to received vector to obtain valid code vector.
a) Syndrome b) Error pattern c) a) or b) d) None of these

9) In block coding, if k = 5 and n = 8, we have _____ k tuples.
a) 13 b) 32 c) 4096 d) 64

10) Viterbi decoding algorithm can be implemented using _____ computation.
a) Add-compare-select b) Compare-add-select
c) Add-select-compare d) Compare-select-add

11) For a code rate 2/3, transition from each state in state diagram of convolutional code are
a) 2 b) 4
c) data is insufficient d) none of these

12) Free distance of non-systematic convolutional code is _____ than that of systematic convolutional code for same code rate.
a) More b) Less c) Equal d) None of these

13) No. of disjoint cells required to implement decoder for convolutional codes are
a) 2^{k-1} b) 2^{k-2} c) 2^k d) None of these

14) The exponent of D in transfer function gives
a) Free distance b) No. of decoded one bit
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15) The parity check matrix of (n, k) block code is of the order of
a) $n \times k$ b) $k \times n$ c) $(n-k) \times n$ d) $k \times (n-k)$

16) Generator matrix is used for
a) Encoding b) Decoding
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17) In a standard array number of coset leaders in (5, 2) code are _____
a) 5 b) 2 c) 3 d) 8

18) Check which of the following is Hamming code.
a) (7, 4) b) (7, 3) c) (6, 3) d) (8, 2)

19) For a generator polynomial $g(x) = 1 + x + x^3$. The cyclic code for this polynomial is
a) (7, 4) b) (8, 5) c) (7, 3) d) (6, 3)

20) If a valid codeword in non-systematic cyclic code is 1101. Which of the following is also a valid codeword ?
a) 0000 b) 1011 c) 0110 d) 1001

_____

SLR-EP – 151

Seat No.	

B.E. (E and TC) (Part – I) Examination, 2016
CODING THEORY

Day and Date : Tuesday, 6-12-2016 Marks : 80
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**

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.

$$f_x(x) = k.x \quad 0 \le x \le 1$$
$$= k \quad 1 \le x \le 2$$
$$= k(3 - x) \quad 2 \le x \le 3$$

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.

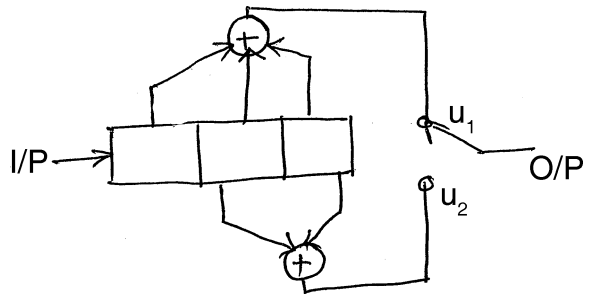
c) Define :

i) Coding gain

ii) Catastrophic error propagation.

d) Explain in brief Turbo encoder.

B) For the given convolutional encoder. **8**



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 $g_2 = 101$: **10**

i) Draw encoder trellis diagram.

ii) Draw decoder trellis diagram.

iii) Find encoded output for input message 1010 from trellis diagram.

Set R

SLR-EP – 151

Seat No.	

Set **S**

B.E. (E and TC) (Part – I) Examination, 2016
CODING THEORY

Day and Date : Tuesday, 6-12-2016 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **20**

1) Generator matrix is used for
   a) Encoding b) Decoding
   c) Standard array d) None of these

2) In a standard array number of coset leaders in (5, 2) code are _____
   a) 5 b) 2 c) 3 d) 8

3) Check which of the following is Hamming code.
   a) (7, 4) b) (7, 3) c) (6, 3) d) (8, 2)

4) For a generator polynomial $g(x) = 1 + x + x^3$. The cyclic code for this polynomial is
   a) (7, 4) b) (8, 5) c) (7, 3) d) (6, 3)

5) If a valid codeword in non-systematic cyclic code is 1101. Which of the following is also a valid codeword ?
   a) 0000 b) 1011 c) 0110 d) 1001

6) A turbo code
   a) is concatenated code b) uses interleaver
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7) Non-systematic convolutional encoder is
   a) FIR system b) IIR system c) Both d) None of these

8) For convolutional code, $g_1 = 111$ and $g_2 = 101$. The code rate and constraint length of this encoder is
   a) 1/2, 3 b) 1/3, 2 c) 1/2, 2 d) 1/3, 3

9) The total area under probability distribution curve is
   a) 0 b) 1
   c) depends on distribution d) none of these

10) Let A and B be two events. If $P(A) = \frac{3}{4}, P(B) = \frac{1}{2}, P(A \cup B) = 1$ and $P(A \cap B) = \frac{1}{4}$, then the conditional probability of B given A is

a) $\frac{1}{3}$ b) $\frac{3}{4}$ c) $\frac{1}{2}$ d) $\frac{1}{4}$

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12) Find the constant C so that

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13) Calculated _____ is added to received vector to obtain valid code vector.
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14) In block coding, if k = 5 and n = 8, we have _____ k tuples.
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15) Viterbi decoding algorithm can be implemented using _____ computation.
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16) For a code rate 2/3, transition from each state in state diagram of convolutional code are
a) 2 b) 4
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17) Free distance of non-systematic convolutional code is _____ than that of systematic convolutional code for same code rate.
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19) The exponent of D in transfer function gives
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20) The parity check matrix of (n, k) block code is of the order of
a) $n \times k$ b) $k \times n$ c) $(n-k) \times n$ d) $k \times (n-k)$

_____

SLR-EP – 151

Seat No.	

B.E. (E and TC) (Part – I) Examination, 2016
CODING THEORY

Day and Date : Tuesday, 6-12-2016 Marks : 80
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**

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 ?

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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 S

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.

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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 :

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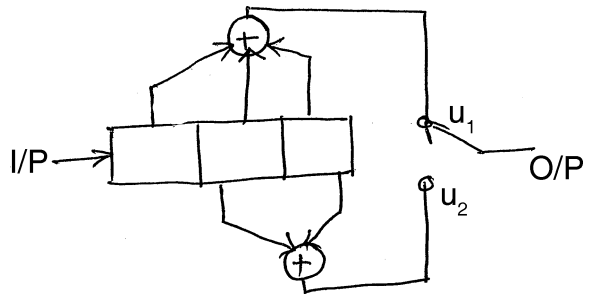
ii) Catastrophic error propagation.

d) Explain in brief Turbo encoder.

B) For the given convolutional encoder. **8**



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 $g_2 = 101$: **10**

i) Draw encoder trellis diagram.

ii) Draw decoder trellis diagram.

iii) Find encoded output for input message 1010 from trellis diagram.

Set S

SLR-EP – 153

Seat No.	

Set **P**

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) User data is transferred in which of the frame mode protocol
   a) LAPF control b) LAPF core
   c) Circuit switching d) None of these

2) Which of the following is slower but reliable frame mode protocol
   a) Frame relay b) Frame switching
   c) Circuit switching d) None of these

3) ISDN uses _____ multiplexing and modulation scheme.
   a) TDM-PCM b) FDM-AM c) Both a) and b) d) None of these

4) ISDN uses
   a) Inband signaling b) Outband signaling
   c) Common channel signaling d) None of these

5) Maximum capacity with basic access of ISDN is
   a) 192 Kbps b) 1.5 Mbps c) 64 Kbps d) None of these

6) The main data channel for ordinary ISDN user is
   a) B channel b) D channel c) H channel d) None of these

7) TE of type 1 means
   a) ISDN device b) Non-ISDN device
   c) Terminal adapter d) None of these

8) Primary access means
   a) 30 B + 1D b) 23 B + 1 D c) Both a) and b) d) None of these

9) AAL type 1 means
   a) conn.oreinted, constant bit rate b) conn.oriented, variable bit rate
   c) conn.less, constant bit rate d) none of these

P.T.O.

10) GFC is required at _____ interface.
a) Network network b) User-network
c) User-user d) None of these

11) Maximum number of buffers are required in case of
a) Input buffers b) Output buffers
c) Crosspoint buffers d) None of these

12) Output lines same as input lines in case of _____ network.
a) Funnel type b) Shuffle exchange
c) Extended matrix d) None of these

13) 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

14) E-mail is _____ type of B-ISDN service.
a) Conversational b) Messaging c) Retrieval d) None of these

15) Virtual path is made up of virtual
a) Circuits b) Channels c) Cells d) None of these

16) 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

17) 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

18) ISDN relies on standard voice data rate of
a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) None of these

19) Basic access means
a) B + D b) 2B + 1D c) 4B + D d) None of these

20) Which of the following channels has highest data rate ?
a) B channel b) H channel c) D channel d) None of these

_____

SLR-EP – 153

Seat No.	

B.E. (E and TC) (Part – II) (Old) Examination, 2016
BROADBAND COMMUNICATION

Day and Date : Monday, 21-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

***Instruction** : **All** questions are **compulsory**.*

SECTION – I

2. Answer **any four** : **(4×5=20)**
   a) Explain X.25 packet switching protocol. **5**
   b) Discuss various link layer core parameters. **5**
   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** : **(2×10=20)**
   a) Along with proper diagram discuss I-series of recommendations. **10**
   b) Explain in detail frame mode protocol architecture. **10**
   c) Explain ISDN interworking. **10**

SECTION – II

4. Write notes on **any four** : **(4×5=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** : **(2×10=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**

Set P

Set P

SLR-EP – 153

Seat No.	

Set 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 reliable frame mode protocol
   a) Frame relay b) Frame switching
   c) Circuit switching d) None of these

8) ISDN uses _____ multiplexing and modulation scheme.
   a) TDM-PCM b) FDM-AM c) Both a) and b) d) None of these

9) ISDN uses
   a) Inband signaling b) Outband signaling
   c) Common channel signaling d) None of these

10) Maximum capacity with basic access of ISDN is
   a) 192 Kbps b) 1.5 Mbps c) 64 Kbps d) None of these

11) The main data channel for ordinary ISDN user is
   a) B channel b) D channel c) H channel d) None of these

12) TE of type 1 means
   a) ISDN device b) Non-ISDN device
   c) Terminal adapter d) None of these

13) Primary access means
   a) 30 B + 1D b) 23 B + 1 D c) Both a) and b) d) None of these

14) AAL type 1 means
   a) conn.oreinted, constant bit rate b) conn.oriented, variable bit rate
   c) conn.less, constant bit rate d) none of these

15) GFC is required at _____ interface.
   a) Network network b) User-network
   c) User-user d) None of these

16) Maximum number of buffers are required in case of
   a) Input buffers b) Output buffers
   c) Crosspoint buffers d) None of these

17) Output lines same as input lines in case of _____ network.
   a) Funnel type b) Shuffle exchange
   c) Extended matrix d) None of these

18) 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 is _____ type of B-ISDN service.
   a) Conversational b) Messaging c) Retrieval d) None of these

20) Virtual path is made up of virtual
   a) Circuits b) Channels c) Cells d) None of these

_____

SLR-EP – 153

Seat No.	

B.E. (E and TC) (Part – II) (Old) Examination, 2016
BROADBAND COMMUNICATION

Day and Date : Monday, 21-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

***Instruction** : **All** questions are **compulsory**.*

SECTION – I

2. Answer **any four** : **(4×5=20)**
   a) Explain X.25 packet switching protocol. **5**
   b) Discuss various link layer core parameters. **5**
   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** : **(2×10=20)**
   a) Along with proper diagram discuss I-series of recommendations. **10**
   b) Explain in detail frame mode protocol architecture. **10**
   c) Explain ISDN interworking. **10**

SECTION – II

4. Write notes on **any four** : **(4×5=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** : **(2×10=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**

Set Q

Set Q

SLR-EP – 153

Seat No.	

Set R

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) Maximum number of buffers are required in case of
   a) Input buffers b) Output buffers
   c) Crosspoint buffers d) None of these

2) Output lines same as input lines in case of _____ network.
   a) Funnel type b) Shuffle exchange
   c) Extended matrix d) None of these

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   a) 53-Byte cells are the ideal size for the voice communication
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   c) 53-Byte cells are the ideal size for circuit switching
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4) E-mail is _____ type of B-ISDN service.
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5) Virtual path is made up of virtual
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6) Which of the following is done in the physical layer of the ATM network ?
   a) Cell multiplexing and demultiplexing
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   c) Transmission frame generation/recovery
   d) Monitoring of the user information field for bit errors and possible corrective actions

P.T.O.

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   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

8) ISDN relies on standard voice data rate of
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) None of these

9) Basic access means
   a) B + D b) 2B + 1D c) 4B + D d) None of these

10) Which of the following channels has highest data rate ?
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   a) LAPF control b) LAPF core
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   a) Inband signaling b) Outband signaling
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15) Maximum capacity with basic access of ISDN is
   a) 192 Kbps b) 1.5 Mbps c) 64 Kbps d) None of these

16) The main data channel for ordinary ISDN user is
   a) B channel b) D channel c) H channel d) None of these

17) TE of type 1 means
   a) ISDN device b) Non-ISDN device
   c) Terminal adapter d) None of these

18) Primary access means
   a) 30 B + 1D b) 23 B + 1 D c) Both a) and b) d) None of these

19) AAL type 1 means
   a) conn.oreinted, constant bit rate b) conn.oriented, variable bit rate
   c) conn.less, constant bit rate d) none of these

20) GFC is required at _____ interface.
   a) Network network b) User-network
   c) User-user d) None of these

_____

SLR-EP – 153

Seat No.	

B.E. (E and TC) (Part – II) (Old) Examination, 2016
BROADBAND COMMUNICATION

Day and Date : Monday, 21-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

***Instruction** : **All** questions are **compulsory**.*

SECTION – I

2. Answer **any four** : **(4×5=20)**
   a) Explain X.25 packet switching protocol. **5**
   b) Discuss various link layer core parameters. **5**
   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** : **(2×10=20)**
   a) Along with proper diagram discuss I-series of recommendations. **10**
   b) Explain in detail frame mode protocol architecture. **10**
   c) Explain ISDN interworking. **10**

SECTION – II

4. Write notes on **any four** : **(4×5=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** : **(2×10=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**

Set R

Set R

SLR-EP – 153

Seat No.	

Set S

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) The main data channel for ordinary ISDN user is
a) B channel b) D channel c) H channel d) None of these

2) TE of type 1 means
a) ISDN device b) Non-ISDN device
c) Terminal adapter d) None of these

3) Primary access means
a) 30 B + 1D b) 23 B + 1 D c) Both a) and b) d) None of these

4) AAL type 1 means
a) conn.oreinted, constant bit rate b) conn.oriented, variable bit rate
c) conn.less, constant bit rate d) none of these

5) GFC is required at _____ interface.
a) Network network b) User-network
c) User-user d) None of these

6) Maximum number of buffers are required in case of
a) Input buffers b) Output buffers
c) Crosspoint buffers d) None of these

7) Output lines same as input lines in case of _____ network.
a) Funnel type b) Shuffle exchange
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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

P.T.O.

9) E-mail is _____ type of B-ISDN service.
   a) Conversational b) Messaging c) Retrieval d) None of these
10) Virtual path is made up of virtual
   a) Circuits b) Channels c) Cells d) None of these
11) 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
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12) What advantages does ATM have over STM ?
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   c) ATM is suitable for real time traffic but not ATM
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13) ISDN relies on standard voice data rate of
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) None of these
14) Basic access means
   a) B + D b) 2B + 1D c) 4B + D d) None of these
15) Which of the following channels has highest data rate ?
   a) B channel b) H channel c) D channel d) None of these
16) User data is transferred in which of the frame mode protocol
   a) LAPF control b) LAPF core
   c) Circuit switching d) None of these
17) Which of the following is slower but reliable frame mode protocol
   a) Frame relay b) Frame switching
   c) Circuit switching d) None of these
18) ISDN uses _____ multiplexing and modulation scheme.
   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

_____

SLR-EP – 153

Seat No.	

B.E. (E and TC) (Part – II) (Old) Examination, 2016
BROADBAND COMMUNICATION

Day and Date : Monday, 21-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

***Instruction** : **All** questions are **compulsory**.*

SECTION – I

2. Answer **any four** : **(4×5=20)**
   a) Explain X.25 packet switching protocol. **5**
   b) Discuss various link layer core parameters. **5**
   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** : **(2×10=20)**
   a) Along with proper diagram discuss I-series of recommendations. **10**
   b) Explain in detail frame mode protocol architecture. **10**
   c) Explain ISDN interworking. **10**

SECTION – II

4. Write notes on **any four** : **(4×5=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** : **(2×10=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**

Set S

Set S

SLR-EP – 154

Seat No.	

Set **P**

B.E. (Electronics and Telecommunication Engg.) (Part – II) (Old) Examination, 2016
AUDIO-VIDEO ENGINEERING

Day and Date : Tuesday, 22-11-2016 Max. Marks : 100
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 Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct alternatives : **(20×1=20)**

1) Static convergence is done for the _____ of the screen.
A) Center B) Edges C) Left D) Right

2) Which of the following is false ?
A) The lens inverts the optical image on the faceplate of the camera tube
B) The composite video signal includes the camera signal and syncnot blanking
C) The standard composite video from a camera is 1V p-p with negative sync
D) The plumbicon uses a lead oxide layer for the target plate

3) In color picture tube, degaussing should be done _____ the color purity adjustments.
A) After B) Before C) Either way D) None at all

4) Which of the following takes more time ?
A) H retrace B) H trace C) V retrace D) V trace

5) How many H lines are there in a complete frame ?
A) 19 lines B) 21 lines C) 262½ lines D) 600 lines

6) How many H lines are there in each V retrace ?
A) One B) Two C) Three D) Four

7) What are the frequencies of H scanning, H sync and H blanking ?
A) 15,750 Hz B) 16,750 Hz C) 31,500 Hz D) 30,050 Hz

P.T.O.

8) Which of the following is not true ?
   A) Line pairing indicates poor interlacing
   B) People look too tall and too thin on a square raster on the picture tube screen
   C) A person can appear to have one shoulder wider than the other because of nonlinear horizontal scanning
   D) The keystone effect produces a square raster

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 analysis, what are the three parts of the composite video signal, for two horizontal lines in the picture ?
   A) Camera signal B) H sync C) H blanking D) All of the above

11) What are the approximate time periods for the visible H trace ?
   A) 5 B) 0.93 C) 10.2 D) 53.5

12) Which pulses in V blanking correspond to the 21H lines wide ?
   A) V sync B) V blanking C) Equalizing D) All of the above

13) Which pulses in V blanking correspond to the 31,500 Hz ?
   A) V sync B) V blanking C) Equalizing D) All of these

14) The average dc level is close to the blanking level for a _____ scene.
   A) Light B) Dark
   C) Either dark or light D) Neither dark nor light

15) The color with the most luminance is
   A) Red B) Yellow C) Green D) Blue

16) What is the hue of a color 90° leading sync burst phase ?
   A) Yellow B) Cyan C) Blue D) Orange

17) The second IF value for color in receivers, for any station, is
   A) 0.5 MHz B) 1.3 MHz C) 3.58 MHz D) 4.5 MHz

18) If the 3.58 – MHz C amplifier in the receiver does not operate, the result will be
   A) No color B) No red
   C) Too much blue D) Too much yellow

19) Which system can be used for both recording and playback ?
   A) CEO B) VHD C) Laser disk D) VHS

20) The hue 180° out of phase with red is
   A) Cyan B) Yellow C) Green D) Blue

_____

SLR-EP – 154

Seat No.	

B.E. (Electronics and Telecommunication Engg.) (Part – II) (Old) Examination, 2016
AUDIO-VIDEO ENGINEERING

Day and Date : Tuesday, 22-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) Draw **neat** diagrams **wherever** necessary.*
*2) Assume suitable data, if **necessary**.*

SECTION – I

2. Attempt **any four** : **16**
   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.

3. Solve **any three** : **24**
   1) Draw and explain the receiver of monochrome TV.
   2) Draw and explain the disc recording system.
   3) List the elements of multimedia system and explain need of multimedia audio video applications.
   4) Draw and explain the construction of image orthicon tube.

SECTION – II

4. Write short note on : **16**
   1) Interleaving process.
   2) Chromaticity diagram.
   3) AFT and AGC.
   4) Satellite television.

5. Solve **any three** : **24**
   1) Draw the block diagram of PAL coder and decoder and explain in brief.
   2) Draw the block diagram of HDTV and explain in brief.
   3) Draw and explain the principle of DVD player. Explain recording and play back in detail.
   4) Compare PAL SECAM and NTSC systems.

———————

Set P

Set P

SLR-EP – 154

Seat No.	

Set Q

B.E. (Electronics and Telecommunication Engg.) (Part – II) (Old) Examination, 2016
AUDIO-VIDEO ENGINEERING

Day and Date : Tuesday, 22-11-2016 Max. Marks : 100
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 Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct alternatives : **(20×1=20)**

1) What is the hue of a color 90° leading sync burst phase ?
A) Yellow B) Cyan C) Blue D) Orange

2) The second IF value for color in receivers, for any station, is
A) 0.5 MHz B) 1.3 MHz C) 3.58 MHz D) 4.5 MHz

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P.T.O.

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A) 19 lines B) 21 lines C) 262½ lines D) 600 lines

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_____

SLR-EP – 154

Seat No.	

B.E. (Electronics and Telecommunication Engg.) (Part – II) (Old) Examination, 2016
AUDIO-VIDEO ENGINEERING

Day and Date : Tuesday, 22-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) Draw **neat** diagrams **wherever** necessary.*
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SECTION – I

2. Attempt **any four** : **16**
   1) Explain principle of recording in brief.
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   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.

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   3) List the elements of multimedia system and explain need of multimedia audio video applications.
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SECTION – II

4. Write short note on : **16**
   1) Interleaving process.
   2) Chromaticity diagram.
   3) AFT and AGC.
   4) Satellite television.

5. Solve **any three** : **24**
   1) Draw the block diagram of PAL coder and decoder and explain in brief.
   2) Draw the block diagram of HDTV and explain in brief.
   3) Draw and explain the principle of DVD player. Explain recording and play back in detail.
   4) Compare PAL SECAM and NTSC systems.

———————

Set Q

Set Q

SLR-EP – 154

Seat No.	

Set R

B.E. (Electronics and Telecommunication Engg.) (Part – II) (Old) Examination, 2016
AUDIO-VIDEO ENGINEERING

Day and Date : Tuesday, 22-11-2016 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) Draw **neat** diagrams **wherever** necessary.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct alternatives : **(20×1=20)**

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6) What is the hue of a color 90° leading sync burst phase ?
A) Yellow B) Cyan C) Blue D) Orange

7) The second IF value for color in receivers, for any station, is
A) 0.5 MHz B) 1.3 MHz C) 3.58 MHz D) 4.5 MHz

8) If the 3.58 – MHz C amplifier in the receiver does not operate, the result will be
A) No color B) No red
C) Too much blue D) Too much yellow

P.T.O.

9) Which system can be used for both recording and playback ?
A) CEO B) VHD C) Laser disk D) VHS

10) The hue 180° out of phase with red is
A) Cyan B) Yellow C) Green D) Blue

11) Static convergence is done for the _____ of the screen.
A) Center B) Edges C) Left D) Right

12) Which of the following is false ?
A) The lens inverts the optical image on the faceplate of the camera tube
B) The composite video signal includes the camera signal and syncnot blanking
C) The standard composite video from a camera is 1V p-p with negative sync
D) The plumbicon uses a lead oxide layer for the target plate

13) In color picture tube, degaussing should be done _____ the color purity adjustments.
A) After B) Before C) Either way D) None at all

14) Which of the following takes more time ?
A) H retrace B) H trace C) V retrace D) V trace

15) How many H lines are there in a complete frame ?
A) 19 lines B) 21 lines C) 262½ lines D) 600 lines

16) How many H lines are there in each V retrace ?
A) One B) Two C) Three D) Four

17) What are the frequencies of H scanning, H sync and H blanking ?
A) 15,750 Hz B) 16,750 Hz C) 31,500 Hz D) 30,050 Hz

18) Which of the following is not true ?
A) Line pairing indicates poor interlacing
B) People look too tall and too thin on a square raster on the picture tube screen
C) A person can appear to have one shoulder wider than the other because of nonlinear horizontal scanning
D) The keystone effect produces a square raster

19) 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

20) In video signal analysis, what are the three parts of the composite video signal, for two horizontal lines in the picture ?
A) Camera signal B) H sync C) H blanking D) All of the above

SLR-EP – 154

Seat No.	

B.E. (Electronics and Telecommunication Engg.) (Part – II) (Old) Examination, 2016
AUDIO-VIDEO ENGINEERING

Day and Date : Tuesday, 22-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) Draw **neat** diagrams **wherever** necessary.*
*2) Assume suitable data, if **necessary**.*

SECTION – I

2. Attempt **any four** : **16**
   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.

3. Solve **any three** : **24**
   1) Draw and explain the receiver of monochrome TV.
   2) Draw and explain the disc recording system.
   3) List the elements of multimedia system and explain need of multimedia audio video applications.
   4) Draw and explain the construction of image orthicon tube.

SECTION – II

4. Write short note on : **16**
   1) Interleaving process.
   2) Chromaticity diagram.
   3) AFT and AGC.
   4) Satellite television.

5. Solve **any three** : **24**
   1) Draw the block diagram of PAL coder and decoder and explain in brief.
   2) Draw the block diagram of HDTV and explain in brief.
   3) Draw and explain the principle of DVD player. Explain recording and play back in detail.
   4) Compare PAL SECAM and NTSC systems.

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Set R

Set R

SLR-EP – 154

Seat No.	

Set **S**

B.E. (Electronics and Telecommunication Engg.) (Part – II) (Old) Examination, 2016
AUDIO-VIDEO ENGINEERING

Day and Date : Tuesday, 22-11-2016 Max. Marks : 100
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 Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct alternatives : **(20×1=20)**

1) How many H lines are there in each V retrace ?
A) One B) Two C) Three D) Four

2) What are the frequencies of H scanning, H sync and H blanking ?
A) 15,750 Hz B) 16,750 Hz C) 31,500 Hz D) 30,050 Hz

3) Which of the following is not true ?
A) Line pairing indicates poor interlacing
B) People look too tall and too thin on a square raster on the picture tube screen
C) A person can appear to have one shoulder wider than the other because of nonlinear horizontal scanning
D) The keystone effect produces a square raster

4) 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

5) In video signal analysis, what are the three parts of the composite video signal, for two horizontal lines in the picture ?
A) Camera signal B) H sync C) H blanking D) All of the above

6) What are the approximate time periods for the visible H trace ?
A) 5 B) 0.93 C) 10.2 D) 53.5

P.T.O.

7) Which pulses in V blanking correspond to the 21H lines wide ?
A) V sync B) V blanking C) Equalizing D) All of the above

8) Which pulses in V blanking correspond to the 31,500 Hz ?
A) V sync B) V blanking C) Equalizing D) All of these

9) The average dc level is close to the blanking level for a _____ scene.
A) Light B) Dark
C) Either dark or light D) Neither dark nor light

10) The color with the most luminance is
A) Red B) Yellow C) Green D) Blue

11) What is the hue of a color 90° leading sync burst phase ?
A) Yellow B) Cyan C) Blue D) Orange

12) The second IF value for color in receivers, for any station, is
A) 0.5 MHz B) 1.3 MHz C) 3.58 MHz D) 4.5 MHz

13) If the 3.58 – MHz C amplifier in the receiver does not operate, the result will be
A) No color B) No red
C) Too much blue D) Too much yellow

14) Which system can be used for both recording and playback ?
A) CEO B) VHD C) Laser disk D) VHS

15) The hue 180° out of phase with red is
A) Cyan B) Yellow C) Green D) Blue

16) Static convergence is done for the _____ of the screen.
A) Center B) Edges C) Left D) Right

17) Which of the following is false ?
A) The lens inverts the optical image on the faceplate of the camera tube
B) The composite video signal includes the camera signal and syncnot blanking
C) The standard composite video from a camera is 1V p-p with negative sync
D) The plumbicon uses a lead oxide layer for the target plate

18) In color picture tube, degaussing should be done _____ the color purity adjustments.
A) After B) Before C) Either way D) None at all

19) Which of the following takes more time ?
A) H retrace B) H trace C) V retrace D) V trace

20) How many H lines are there in a complete frame ?
A) 19 lines B) 21 lines C) 262½ lines D) 600 lines

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SLR-EP – 154

Seat No.	

B.E. (Electronics and Telecommunication Engg.) (Part – II) (Old) Examination, 2016
AUDIO-VIDEO ENGINEERING

Day and Date : Tuesday, 22-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) Draw **neat** diagrams **wherever** necessary.*
*2) Assume suitable data, if **necessary**.*

SECTION – I

2. Attempt **any four** : **16**
   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.

3. Solve **any three** : **24**
   1) Draw and explain the receiver of monochrome TV.
   2) Draw and explain the disc recording system.
   3) List the elements of multimedia system and explain need of multimedia audio video applications.
   4) Draw and explain the construction of image orthicon tube.

SECTION – II

4. Write short note on : **16**
   1) Interleaving process.
   2) Chromaticity diagram.
   3) AFT and AGC.
   4) Satellite television.

5. Solve **any three** : **24**
   1) Draw the block diagram of PAL coder and decoder and explain in brief.
   2) Draw the block diagram of HDTV and explain in brief.
   3) Draw and explain the principle of DVD player. Explain recording and play back in detail.
   4) Compare PAL SECAM and NTSC systems.

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Set S

Set S

SLR-EP – 155

Seat No.	

Set **P**

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 : **(20×1=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

P.T.O.

8) LPC2148 has _____ on chip flash program memory.
   a) 32 KB b) 64 KB c) 8 KB d) 512 KB

9) Total number of available ADC inputs for LPC 2148 is
   a) 06 b) 08 c) 12 d) None of above

10) ARM 7 core has a Von Neumann-style architecture 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

11) A thread is a _____ process.
   a) multi process b) inter thread process
   c) light weight d) none of above

12) What function are typically considered “operating system” ?
   a) Memory Management b) Process scheduling
   c) All management function d) User processes

13) Real time operating systems can be found in
   a) PDAS b) Scientific instruments
   c) Cell phones d) PDC

14) Inter process communication
   a) is required for all processes b) is usually done via disk drivers
   c) is never necessary d) all processes to synchronize activity

15) The initial value of semaphore that allows only one of the many processes to enter critical section is
   a) 8 b) 1 c) 16 d) 0

16) 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

17) 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

18) 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

19) 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

20) PCB =
   a) Programming Control Block b) Program Control Block
   c) Process Communication Block d) None of above

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SLR-EP – 155

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 : **(5×4=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 : **(10×2=20)**

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.

Set P

SECTION – II

4. Solve **any four** questions : **(5×4=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 : **(10×2=20)**

   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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SLR-EP – 155

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 : **(20×1=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

P.T.O.

7) 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

8) In I2C high speed mode high speed is given as
   a) 400 Kbps b) 800 Kbps c) 1600 Kbps d) None of above

9) In embedded system, A cache provides
   a) overall increase in performance
   b) increase in execution time
   c) through put decreases
   d) none of above

10) 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

11) 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

12) Embedded system specific trends are
   a) Amount of memory b) Real time constraints
   c) Design time d) All of above

13) LPC2148 has _____ on chip flash program memory.
   a) 32 KB b) 64 KB c) 8 KB d) 512 KB

14) Total number of available ADC inputs for LPC 2148 is
   a) 06 b) 08 c) 12 d) None of above

15) ARM 7 core has a Von Neumann-style architecture 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

16) A thread is a _____ process.
   a) multi process b) inter thread process
   c) light weight d) none of above

17) What function are typically considered “operating system” ?
   a) Memory Management b) Process scheduling
   c) All management function d) User processes

18) Real time operating systems can be found in
   a) PDAS b) Scientific instruments
   c) Cell phones d) PDC

19) Inter process communication
   a) is required for all processes b) is usually done via disk drivers
   c) is never necessary d) all processes to synchronize activity

20) The initial value of semaphore that allows only one of the many processes to enter critical section is
   a) 8 b) 1 c) 16 d) 0

SLR-EP – 155

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 : **(5×4=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 : **(10×2=20)**

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.

Set Q

SECTION – II

4. Solve **any four** questions : **(5×4=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 : **(10×2=20)**

   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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SLR-EP – 155

Seat No.	

Set **R**

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 : **(20×1=20)**

1) A thread is a _____ process.
   a) multi process b) inter thread process
   c) light weight d) none of above

2) What function are typically considered "operating system" ?
   a) Memory Management b) Process scheduling
   c) All management function d) User processes

3) Real time operating systems can be found in
   a) PDAS b) Scientific instruments
   c) Cell phones d) PDC

4) Inter process communication
   a) is required for all processes b) is usually done via disk drivers
   c) is never necessary d) all processes to synchronize activity

5) The initial value of semaphore that allows only one of the many processes to enter critical section is
   a) 8 b) 1 c) 16 d) 0

6) 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

7) Round-robin scheduling
   a) Allows interactive task quicker access to processor
   b) Is quite complex to implement
   c) Gives each task the same chance at the processor
   d) None of the above

8) The FIFO algorithm
   a) Execute first the job that last entered the queue
   b) Execute first the job that first entered the queue
   c) Execute first the job that has been in the queue the longest
   d) None of above

P.T.O.

9) 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

10) PCB =
   a) Programming Control Block
   b) Program Control Block
   c) Process Communication Block
   d) None of above

11) 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

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 as
   a) 400 Kbps b) 800 Kbps c) 1600 Kbps d) None of above

14) In embedded system, A cache provides
   a) overall increase in performance
   b) increase in execution time
   c) through put decreases
   d) none of above

15) 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

16) 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

17) Embedded system specific trends are
   a) Amount of memory
   b) Real time constraints
   c) Design time
   d) All of above

18) LPC2148 has _____ on chip flash program memory.
   a) 32 KB b) 64 KB c) 8 KB d) 512 KB

19) Total number of available ADC inputs for LPC 2148 is
   a) 06 b) 08 c) 12 d) None of above

20) ARM 7 core has a Von Neumann-style architecture 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

_____

SLR-EP – 155

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 : **(5×4=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 : **(10×2=20)**

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.

Set R

SECTION – II

4. Solve **any four** questions : **(5×4=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 : **(10×2=20)**

   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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SLR-EP – 155

Seat No.	

Set **S**

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 : **(20×1=20)**

1) 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

2) Embedded system specific trends are
   a) Amount of memory b) Real time constraints
   c) Design time d) All of above

3) LPC2148 has _____ on chip flash program memory.
   a) 32 KB b) 64 KB c) 8 KB d) 512 KB

4) Total number of available ADC inputs for LPC 2148 is
   a) 06 b) 08 c) 12 d) None of above

5) ARM 7 core has a Von Neumann-style architecture 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

6) A thread is a _____ process.
   a) multi process b) inter thread process
   c) light weight d) none of above

7) What function are typically considered "operating system" ?
   a) Memory Management b) Process scheduling
   c) All management function d) User processes

8) Real time operating systems can be found in
   a) PDAS b) Scientific instruments
   c) Cell phones d) PDC

9) Inter process communication
   a) is required for all processes b) is usually done via disk drivers
   c) is never necessary d) all processes to synchronize activity

P.T.O.

10) The initial value of semaphore that allows only one of the many processes to enter critical section is
a) 8 b) 1 c) 16 d) 0

11) 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

12) 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

13) 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

14) 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

15) PCB =
a) Programming Control Block b) Program Control Block
c) Process Communication Block d) None of above

16) 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

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 given as
a) 400 Kbps b) 800 Kbps c) 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 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

———————

SLR-EP – 155

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 : **(5×4=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 : **(10×2=20)**

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.

Set S

SECTION – II

4. Solve **any four** questions : **(5×4=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 : **(10×2=20)**

   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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SLR-EP – 157

Seat No.	

Set P

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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct alternatives : **(20×1=20)**

1) Hop by hop error and flow control is present in
   a) Frame relay b) Packet switching
   c) Cell relay d) None

2) Which of the following is faster but unreliable protocol ?
   a) Frame relay b) Packet switching
   c) Circuit switching d) Frame switching

3) X.25 is standard for
   a) Frame relay b) Packet switching
   c) Cell relay d) None

4) ISDN relies on standard voice data rate of
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) 2 Mbps

5) ISDN uses _____ multiplexing and modulation scheme.
   a) TDM-PCM b) FDM-AM c) TDM-AM d) FDM-PCM

6) ISDN uses
   a) Inband signaling b) Outband signaling
   c) Common channel signaling d) None

7) Modulation-demodulation is required at every hop of a network using
   a) Bridge b) Analog switch c) Digital switch d) Circuit switch

8) Maximum capacity with basic access of ISDN is
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) 2 Mbps
9) The main data channel for ordinary ISDN user is
   a) B channel b) D channel c) H channel d) H0 channel
10) Primary access means
   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 channel is an example of _____ service.
   a) Interactive b) Distribution c) Conversational d) Messaging
14) Virtual path is made up of virtual
   a) Circuits b) Channels c) Cells d) Connections
15) ATM cell is made up of
   a) 48 bytes b) 53 bytes c) 64 bytes d) 5 bytes
16) AAL type 1 means
   a) Connection oriented, constant bit rate
   b) Connection oriented, variable bit rate
   c) Connectionless, constant bit rate
   d) Connectionless, variable bit rate
17) ATM cells are routed using _____ field inside ATM cell.
   a) GFC b) HEC c) VPI-VCI d) Payload type
18) GFC is required at _____ interface.
   a) Network to network b) User to network
   c) User to user d) Network to user
19) Maximum number of buffers are required in case of
   a) Input buffers b) Output buffers
   c) Crosspoint buffers d) None
20) Output lines are less than input lines in case of _____ ATM network.
   a) Funnel type b) Shuffle exchange
   c) Extended matrix d) None

_____

SLR-EP – 157

Seat No.	

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** : **(4×5=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** : **(2×10=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** : **(4×5=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** : **(2×10=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.

Set P

Set P

SLR-EP – 157

Seat No.	

Set Q

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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct alternatives : **(20×1=20)**

1) AAL type 1 means
   a) Connection oriented, constant bit rate
   b) Connection oriented, variable bit rate
   c) Connectionless, constant bit rate
   d) Connectionless, variable bit rate

2) ATM cells are routed using _____ field inside ATM cell.
   a) GFC b) HEC c) VPI-VCI d) Payload type

3) GFC is required at _____ interface.
   a) Network to network b) User to network
   c) User to user d) Network to user

4) Maximum number of buffers are required in case of
   a) Input buffers b) Output buffers
   c) Crosspoint buffers d) None

5) Output lines are less than input lines in case of _____ ATM network.
   a) Funnel type b) Shuffle exchange
   c) Extended matrix d) None

6) Hop by hop error and flow control is present in
   a) Frame relay b) Packet switching
   c) Cell relay d) None

P.T.O.

7) Which of the following is faster but unreliable protocol ?
   a) Frame relay b) Packet switching
   c) Circuit switching d) Frame switching

8) X.25 is standard for
   a) Frame relay b) Packet switching
   c) Cell relay d) None

9) ISDN relies on standard voice data rate of
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) 2 Mbps

10) ISDN uses _____ multiplexing and modulation scheme.
   a) TDM-PCM b) FDM-AM c) TDM-AM d) FDM-PCM

11) ISDN uses
   a) Inband signaling b) Outband signaling
   c) Common channel signaling d) None

12) Modulation-demodulation is required at every hop of a network 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 channel for ordinary ISDN user is
   a) B channel b) D channel c) H channel d) H0 channel

15) Primary access means
   a) 23 B + 2 D b) 23 B + 1D c) 2B + D d) B + D

16) B-ISDN uses _____ as PDU.
   a) Frame b) Packet c) Cell d) None

17) B-ISDN uses _____ coding.
   a) NRZ b) RZ c) CMI d) None

18) Broadcast TV channel is an example of _____ service.
   a) Interactive b) Distribution c) Conversational d) Messaging

19) Virtual path is made up of virtual
   a) Circuits b) Channels c) Cells d) Connections

20) ATM cell is made up of
   a) 48 bytes b) 53 bytes c) 64 bytes d) 5 bytes

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SLR-EP – 157

Seat No.	

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** : **(4×5=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** : **(2×10=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** : **(4×5=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** : **(2×10=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.

Set Q

_____

Set Q

SLR-EP – 157

Seat No.	

Set R

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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct alternatives : **(20×1=20)**

1) B-ISDN uses _____ as PDU.
a) Frame b) Packet c) Cell d) None

2) B-ISDN uses _____ coding.
a) NRZ b) RZ c) CMI d) None

3) Broadcast TV channel is an example of _____ service.
a) Interactive b) Distribution c) Conversational d) Messaging

4) Virtual path is made up of virtual
a) Circuits b) Channels c) Cells d) Connections

5) ATM cell is made up of
a) 48 bytes b) 53 bytes c) 64 bytes d) 5 bytes

6) AAL type 1 means
a) Connection oriented, constant bit rate
b) Connection oriented, variable bit rate
c) Connectionless, constant bit rate
d) Connectionless, variable bit rate

7) ATM cells are routed using _____ field inside ATM cell.
a) GFC b) HEC c) VPI-VCI d) Payload type

8) GFC is required at _____ interface.
   a) Network to network b) User to network
   c) User to user d) Network to user

9) Maximum number of buffers are required in case of
   a) Input buffers b) Output buffers
   c) Crosspoint buffers d) None

10) Output lines are less than input lines in case of _____ ATM network.
   a) Funnel type b) Shuffle exchange
   c) Extended matrix d) None

11) Hop by hop error and flow control is present in
   a) Frame relay b) Packet switching
   c) Cell relay d) None

12) Which of the following is faster but unreliable protocol ?
   a) Frame relay b) Packet switching
   c) Circuit switching d) Frame switching

13) X.25 is standard for
   a) Frame relay b) Packet switching
   c) Cell relay d) None

14) ISDN relies on standard voice data rate of
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) 2 Mbps

15) ISDN uses _____ multiplexing and modulation scheme.
   a) TDM-PCM b) FDM-AM c) TDM-AM d) FDM-PCM

16) ISDN uses
   a) Inband signaling b) Outband signaling
   c) Common channel signaling d) None

17) Modulation-demodulation is required at every hop of a network using
   a) Bridge b) Analog switch c) Digital switch d) Circuit switch

18) Maximum capacity with basic access of ISDN is
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) 2 Mbps

19) The main data channel for ordinary ISDN user is
   a) B channel b) D channel c) H channel d) H0 channel

20) Primary access means
   a) 23 B + 2 D b) 23 B + 1D c) 2B + D d) B + D

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SLR-EP – 157

Seat No.	

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** : **(4×5=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** : **(2×10=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** : **(4×5=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** : **(2×10=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.

Set R

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Set R

SLR-EP – 157

Seat No.	

Set S

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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct alternatives : **(20×1=20)**

1) ISDN uses
   a) Inband signaling b) Outband signaling
   c) Common channel signaling d) None

2) Modulation-demodulation is required at every hop of a network using
   a) Bridge b) Analog switch c) Digital switch d) Circuit switch

3) Maximum capacity with basic access of ISDN is
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) 2 Mbps

4) The main data channel for ordinary ISDN user is
   a) B channel b) D channel c) H channel d) H0 channel

5) Primary access means
   a) 23 B + 2 D b) 23 B + 1D c) 2B + D d) B + D

6) B-ISDN uses _____ as PDU.
   a) Frame b) Packet c) Cell d) None

7) B-ISDN uses _____ coding.
   a) NRZ b) RZ c) CMI d) None

8) Broadcast TV channel is an example of _____ service.
   a) Interactive b) Distribution c) Conversational d) Messaging

9) Virtual path is made up of virtual
   a) Circuits b) Channels c) Cells d) Connections
10) ATM cell is made up of
   a) 48 bytes b) 53 bytes c) 64 bytes d) 5 bytes
11) AAL type 1 means
   a) Connection oriented, constant bit rate
   b) Connection oriented, variable bit rate
   c) Connectionless, constant bit rate
   d) Connectionless, variable bit rate
12) ATM cells are routed using _____ field inside ATM cell.
   a) GFC b) HEC c) VPI-VCI d) Payload type
13) GFC is required at _____ interface.
   a) Network to network b) User to network
   c) User to user d) Network to user
14) Maximum number of buffers are required in case of
   a) Input buffers b) Output buffers
   c) Crosspoint buffers d) None
15) Output lines are less than input lines in case of _____ ATM network.
   a) Funnel type b) Shuffle exchange
   c) Extended matrix d) None
16) Hop by hop error and flow control is present in
   a) Frame relay b) Packet switching
   c) Cell relay d) None
17) Which of the following is faster but unreliable protocol ?
   a) Frame relay b) Packet switching
   c) Circuit switching d) Frame switching
18) X.25 is standard for
   a) Frame relay b) Packet switching
   c) Cell relay d) None
19) ISDN relies on standard voice data rate of
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) 2 Mbps
20) ISDN uses _____ multiplexing and modulation scheme.
   a) TDM-PCM b) FDM-AM c) TDM-AM d) FDM-PCM

_____

SLR-EP – 157

Seat No.	

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** : **(4×5=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** : **(2×10=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** : **(4×5=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** : **(2×10=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.

Set S

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Set S

SLR-EP – 158

Seat No.	

Set **P**

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 Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) Compact disc surface doesn't wear out because the sensor is
   a) Electric b) Magnetic c) Mechanical d) Optical
2) From where is the laser beam not reflected in video disc ?
   a) From a flat b) From a pit
   c) From a land d) From a glass
3) What is the number of fields per second in India ?
   a) 25 b) 50 c) 625 d) 15625
4) Chroma signal requires _____ detector in receiver.
   a) Envelope b) Balanced
   c) Ratio d) Foster selley discriminator
5) _____ is not used in T.V. Receiver
   a) Cathode ray tube b) Loudspeaker
   c) Photosensitive semiconductor d) Integrated circuit
6) Radiation resistance of half wave dipole is _____ ohm.
   a) 100 b) 73 c) 36.5 d) 300
7) The following is not an F.M. detector
   a) PLL detector b) Phase shift discriminator
   c) Ratio Detector d) Envelope detector

8) Horizontal trace is scanning takes _____ microseconds.
   a) 52 b) 60 c) 63.5 d) 64
9) Which of the following working is like working of disc recording unit ?
   a) Motor b) Dynamo c) Microphone d) Generator
10) The value of kell factor is about
   a) 0.3 b) 0.5 c) 0.7 d) 0.9
11) Moving Picture Experts Group (MPEG) is used to compress
   a) Frames b) Images c) Audio d) Video
12) A combination of encryption algorithm and a decryption algorithm is called a
   a) plain text b) cipher c) original text d) shift cipher
13) The most common compression technique that is used to create CD-quality audio is based on perceptual encoding technique is called
   a) Predictive Encoding b) Perceptual Encoding
   c) MPEG d) JPEG
14) Audio and Video compression, each frame is divided into small grids, called picture elements or
   a) Frame b) Packets c) Pixels d) Mega pixels
15) _____ is a standard to allow telephones on the public telephone network to talk to computers connected to the Internet.
   a) SIP b) H.323
   c) Q.991 d) None of the above
16) When there is more than one source, the _____ identifier defines the mixer.
   a) Synchronization source b) Contributor
   c) Time stamp d) None of the above
17) _____ is the protocol designed to handle real time traffic on the Internet.
   a) TCP b) UDP c) RTP d) None of the above
18) The real time video conference, data from the server is _____ to the client sites.
   a) unicast b) multicast c) broadcast d) none of the above
19) Real time traffic needs the support of
   a) broadcasting b) multicasting c) both a) and b) d) none of the above
20) _____ means combining several streams of traffic into one stream.
   a) Translation b) Mixing c) Both a) and b) d) None of the above

_____

SLR-EP – 158

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.

SLR-EP – 158

Seat No.	

Set Q

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 Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) When there is more than one source, the _____ identifier defines the mixer.
   a) Synchronization source b) Contributor
   c) Time stamp d) None of the above

2) _____ is the protocol designed to handle real time traffic on the Internet.
   a) TCP b) UDP c) RTP d) None of the above

3) The real time video conference, data from the server is _____ to the client sites.
   a) unicast b) multicast c) broadcast d) none of the above

4) Real time traffic needs the support of
   a) broadcasting b) multicasting c) both a) and b) d) none of the above

5) _____ means 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 surface doesn't wear out because the sensor is
   a) Electric b) Magnetic c) Mechanical d) Optical

7) From where is the laser beam not reflected in video disc ?
   a) From a flat b) From a pit
   c) From a land d) From a glass

P.T.O.

8) What is the number of fields per second in India ?
   a) 25 b) 50 c) 625 d) 15625

9) Chroma signal requires _____ detector in receiver.
   a) Envelope b) Balanced
   c) Ratio d) Foster selley discriminator

10) _____ is not used in T.V. Receiver
   a) Cathode ray tube b) Loudspeaker
   c) Photosensitive semiconductor d) Integrated circuit

11) Radiation resistance of half wave dipole is _____ 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 discriminator
   c) Ratio Detector d) Envelope detector

13) Horizontal trace is scanning takes _____ microseconds.
   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 factor is about
   a) 0.3 b) 0.5 c) 0.7 d) 0.9

16) Moving Picture Experts Group (MPEG) is used to compress
   a) Frames b) Images c) Audio d) Video

17) A combination of encryption algorithm and a decryption algorithm is called a
   a) plain text b) cipher c) original text d) shift cipher

18) The most common compression technique that is used to create CD-quality audio is based on perceptual encoding technique is called
   a) Predictive Encoding b) Perceptual Encoding
   c) MPEG d) JPEG

19) Audio and Video compression, each frame is divided into small grids, called picture elements or
   a) Frame b) Packets c) Pixels d) Mega pixels

20) _____ is a standard to allow telephones on the public telephone network to talk to computers connected to the Internet.
   a) SIP b) H.323
   c) Q.991 d) None of the above

_____

SLR-EP – 158

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.

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SLR-EP – 158

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 : 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 Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) Moving Picture Experts Group (MPEG) is used to compress
   a) Frames b) Images c) Audio d) Video
2) A combination of encryption algorithm and a decryption algorithm is called a
   a) plain text b) cipher c) original text d) shift cipher
3) The most common compression technique that is used to create CD-quality audio is based on perceptual encoding technique is called
   a) Predictive Encoding b) Perceptual Encoding
   c) MPEG d) JPEG
4) Audio and Video compression, each frame is divided into small grids, called picture elements or
   a) Frame b) Packets c) Pixels d) Mega pixels
5) _____ is a standard to allow telephones on the public telephone network to talk to computers connected to the Internet.
   a) SIP b) H.323
   c) Q.991 d) None of the above
6) When there is more than one source, the _____ identifier defines the mixer.
   a) Synchronization source b) Contributor
   c) Time stamp d) None of the above

7) _____ is the protocol designed to handle real time traffic on the Internet.
a) TCP b) UDP c) RTP d) None of the above

8) The real time video conference, data from the server is _____ to the client sites.
a) unicast b) multicast c) broadcast d) none of the above

9) Real time traffic needs the support of
a) broadcasting b) multicasting c) both a) and b) d) none of the above

10) _____ means combining several streams of traffic into one stream.
a) Translation b) Mixing c) Both a) and b) d) None of the above

11) Compact disc surface doesn't wear out because the sensor is
a) Electric b) Magnetic c) Mechanical d) Optical

12) From where is the laser beam not reflected 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 India ?
a) 25 b) 50 c) 625 d) 15625

14) Chroma signal requires _____ detector in receiver.
a) Envelope b) Balanced
c) Ratio d) Foster selley discriminator

15) _____ is not used in T.V. Receiver
a) Cathode ray tube b) Loudspeaker
c) Photosensitive semiconductor d) Integrated circuit

16) Radiation resistance of half wave dipole is _____ ohm.
a) 100 b) 73 c) 36.5 d) 300

17) The following is not an F.M. detector
a) PLL detector b) Phase shift discriminator
c) Ratio Detector d) Envelope detector

18) Horizontal trace is scanning takes _____ microseconds.
a) 52 b) 60 c) 63.5 d) 64

19) Which of the following working is like working of disc recording unit ?
a) Motor b) Dynamo c) Microphone d) Generator

20) The value of kell factor is about
a) 0.3 b) 0.5 c) 0.7 d) 0.9

_____

SLR-EP – 158

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.

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SLR-EP – 158

Seat No.	

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 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 Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) Radiation resistance of half wave dipole is _____ ohm.
a) 100 b) 73 c) 36.5 d) 300

2) The following is not an F.M. detector
a) PLL detector b) Phase shift discriminator
c) Ratio Detector d) Envelope detector

3) Horizontal trace is scanning takes _____ microseconds.
a) 52 b) 60 c) 63.5 d) 64

4) Which of the following working is like working of disc recording unit ?
a) Motor b) Dynamo c) Microphone d) Generator

5) The value of kell factor is about
a) 0.3 b) 0.5 c) 0.7 d) 0.9

6) Moving Picture Experts Group (MPEG) is used to compress
a) Frames b) Images c) Audio d) Video

7) A combination of encryption algorithm and a decryption algorithm is called a
a) plain text b) cipher c) original text d) shift cipher

8) The most common compression technique that is used to create CD-quality audio is based on perceptual encoding technique is called
a) Predictive Encoding b) Perceptual Encoding
c) MPEG d) JPEG

P.T.O.

9) Audio and Video compression, each frame is divided into small grids, called picture elements or

a) Frame b) Packets c) Pixels d) Mega pixels

10) _____ is a standard to allow telephones on the public telephone network to talk to computers connected to the Internet.

a) SIP b) H.323

c) Q.991 d) None of the above

11) When there is more than one source, the _____ identifier defines the mixer.

a) Synchronization source b) Contributor

c) Time stamp d) None of the above

12) _____ is the protocol designed to handle real time traffic on the Internet.

a) TCP b) UDP c) RTP d) None of the above

13) The real time video conference, data from the server is _____ to the client sites.

a) unicast b) multicast c) broadcast d) none of the above

14) Real time traffic needs the support of

a) broadcasting b) multicasting c) both a) and b) d) none of the above

15) _____ means combining several streams of traffic into one stream.

a) Translation b) Mixing c) Both a) and b) d) None of the above

16) Compact disc surface doesn't wear out because the sensor is

a) Electric b) Magnetic c) Mechanical d) Optical

17) From where is the laser beam not reflected in video disc ?

a) From a flat b) From a pit

c) From a land d) From a glass

18) What is the number of fields per second in India ?

a) 25 b) 50 c) 625 d) 15625

19) Chroma signal requires _____ detector in receiver.

a) Envelope b) Balanced

c) Ratio d) Foster selley discriminator

20) _____ is not used in T.V. Receiver

a) Cathode ray tube b) Loudspeaker

c) Photosensitive semiconductor d) Integrated circuit

_____

SLR-EP – 158

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.

SLR-EP – 159

Seat No.	

Set **P**

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) 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
2) Using USB up to _____ devices may be connected to a single host controller.
   a) 2 b) 64 c) 127 d) 256
3) 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
4) 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
5) _____ mode is a special version of user mode that allows full read-write access to the cpsr.
   a) Supervisor b) System c) Undefined d) Abort
6) The ARM register _____ is called link register.
   a) R 12 b) R 13 c) R 14 d) R 15
7) In ARM _____ exception is having highest priority.
   a) Reset b) Supervisor
   c) System d) Interrupt Request
8) If External frequency = 12 MHz, CCLK= 48 MHz and PCLK = 24 MHz then PLLCFG and VPBDIV values are
   a) 0 × 23 and 0 × 01 b) 0 × 23 and 0 × 00
   c) 0 × 23 and 0 × 02 d) 0 × 22 and 0 × 00

P.T.O.

9) 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

10) r2 = 0 × 0000 0002, r4 = 0 × 0000 0001
    LSL r2, r4 results
   a) r2 = 0 × 0000 0004, r4 = 0 × 0000 0001
   b) r2 = 0 × 0000 0004, r4 = 0 × 0000 0002
   c) r2 = 0 × 0000 0001, r2 = 0 × 0000 0002
   d) None of above

SECTION – II

11) Scheduling is
   a) Allowing jobs to use the processor
   b) Un related to performance consideration
   c) The same regardless of purpose of system
   d) None of the above

12) Memory management is
   a) not used in modern operating system
   b) replaced with virtual memory on current systems
   c) not used in multiprogramming system
   d) none of above

13) Process is
   a) Program in high level language kept on disk
   b) Content of main memory
   c) A program in execution
   d) A job in secondary memory

14) Which of the following option is not true ?
   a) A signal is boolean notification
   b) A signal and semaphore are of one bit each
   c) A signal and mutex are of one bit each
   d) A signal, a semaphore and a message are of one bit each

15) Medical devices often run a _____ operating system.
   a) Real time
   b) Single user
   c) Multi user
   d) Network

16) Event flags are used when
   a) Task need to synchronise with the occurrence of multiple events
   b) Task need to synchronise with the occurrence of two events
   c) Interprocess communication required
   d) None of above

17) Real time operating systems can be found in
   a) PDAS
   b) Scientific instruments
   c) Cell phones
   d) PDC

18) 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

19) Inter task communication can be done through
   a) Mailbox b) Queue c) Pipes d) All of above

20) 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

_____

SLR-EP – 159

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. **(5×4 =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. **(10×2 =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.

SECTION – II

4. Solve **any four** questions. **(5×4 =20)**

   1) Explain application of RTOS.

   2) Explain Kernel Services in an Operating System (RTOS).

   3) Explain Kernel structure of μ 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. **(10×2 =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.

SLR-EP – 159

Seat No.	

Set **Q**

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) In ARM _____ exception is having highest priority.
   a) Reset b) Supervisor
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2) If External frequency = 12 MHz, CCLK= 48 MHz and PCLK = 24 MHz then PLLCFG and VPBDIV values are
   a) 0 × 23 and 0 × 01 b) 0 × 23 and 0 × 00
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3) On interrupt, processor does the following
   a) Copies CPSR to SPSR mode b) Copies SPSR to CPSR mode
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4) r2 = 0 × 0000 0002, r4 = 0 × 0000 0001
   LSL r2, r4 results
   a) r2 = 0 × 0000 0004, r4 = 0 × 0000 0001 b) r2 = 0 × 0000 0004, r4 = 0 × 0000 0002
   c) r2 = 0 × 0000 0001, r2 = 0 × 0000 0002 d) None of above
5) _____ mode is a special version of user mode that allows full read-write access to the cpsr.
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6) The ARM register _____ is called link register.
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7) Condition test for
   a) GT (greater than) means N and Z = 0
   b) GT (greater than) means V and Z = 0
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8) 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

P.T.O.

9) 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

10) Using USB up to _____ devices may be connected to a single host controller.
   a) 2 b) 64 c) 127 d) 256

SECTION – II

11) Real time operating systems can be found in
   a) PDAS b) Scientific instruments
   c) Cell phones d) PDC

12) Round-robin scheduling
   a) Allows interactive task quicker access to processor
   b) Is quite complex to implement
   c) Gives each task the same chance at the processor
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13) Inter task communication can be done through
   a) Mailbox b) Queue c) Pipes d) All of above

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   a) Synchronise critical resources to prevent dead lock
   b) Are used to do I/O
   c) Are used for memory management
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   c) Multi user d) Network

16) Event flags are used when
   a) Task need to synchronise with the occurrence of multiple events
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   c) Interprocess communication required
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17) Process is
   a) Program in high level language kept on disk
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   c) A program in execution
   d) A job in secondary memory

18) Which of the following option is not true ?
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   b) A signal and semaphore are of one bit each
   c) A signal and mutex are of one bit each
   d) A signal, a semaphore and a message are of one bit each

19) Scheduling is
   a) Allowing jobs to use the processor
   b) Unrelated to performance consideration
   c) The same regardless of purpose of system
   d) None of the above

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   a) not used in modern operating system
   b) replaced with virtual memory on current systems
   c) not used in multiprogramming system
   d) none of above

SLR-EP – 159

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. **(5×4 =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. **(10×2 =20)**

1) Explain exceptions, interrupt and vector table for ARM processor. What is TCM ?

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   a) LDRB
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   c) LSL
   d) MLA
   e) BX

3) Draw and explain the data flow model of ARM core.

SECTION – II

4. Solve **any four** questions. **(5×4 =20)**

   1) Explain application of RTOS.

   2) Explain Kernel Services in an Operating System (RTOS).

   3) Explain Kernel structure of μ 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. **(10×2 =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.

SLR-EP – 159

Seat No.	

Set **R**

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) _____ mode is a special version of user mode that allows full read-write access to the cpsr.
   a) Supervisor b) System c) Undefined d) Abort
2) The ARM register _____ is called link register.
   a) R 12 b) R 13 c) R 14 d) R 15
3) 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
4) Using USB up to _____ devices may be connected to a single host controller.
   a) 2 b) 64 c) 127 d) 256
5) In ARM _____ exception is having highest priority.
   a) Reset b) Supervisor
   c) System d) Interrupt Request
6) If External frequency = 12 MHz, CCLK= 48 MHz and PCLK = 24 MHz then PLLCFG and VPBDIV values are
   a) 0 × 23 and 0 × 01 b) 0 × 23 and 0 × 00
   c) 0 × 23 and 0 × 02 d) 0 × 22 and 0 × 00
7) 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
8) r2 = 0 × 0000 0002, r4 = 0 × 0000 0001
   LSL r2, r4 results
   a) r2 = 0 × 0000 0004, r4 = 0 × 0000 0001 b) r2 = 0 × 0000 0004, r4 = 0 × 0000 0002
   c) r2 = 0 × 0000 0001, r2 = 0 × 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 = 0
   d) GT (greater than) means Z = 0

10) 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

SECTION – II

11) Medical devices often run a _____ operating system.
   a) Real time b) Single user c) Multi user d) Network

12) Event flags are used when
   a) Task need to synchronise with the occurrence of multiple events
   b) Task need to synchronise with the occurrence of two events
   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 system
   d) None of the above

14) Memory management is
   a) not used in modern operating system
   b) replaced with virtual memory on current systems
   c) not used in multiprogramming system
   d) none of above

15) Real time operating systems can be found in
   a) PDAS
   b) Scientific instruments
   c) Cell phones
   d) PDC

16) 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

17) Inter task communication can be done through
   a) Mailbox b) Queue c) Pipes d) All of above

18) 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

19) Process is
   a) Program in high level language kept on disk
   b) Content of main memory
   c) A program in execution
   d) A job in secondary memory

20) Which of the following option is not true ?
   a) A signal is boolean notification
   b) A signal and semaphore are of one bit each
   c) A signal and mutex are of one bit each
   d) A signal, a semaphore and a message are of one bit each

_____

SLR-EP – 159

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. **(5×4 =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. **(10×2 =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. **(5×4 =20)**

   1) Explain application of RTOS.

   2) Explain Kernel Services in an Operating System (RTOS).

   3) Explain Kernel structure of μ 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. **(10×2 =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.

SLR-EP – 159

Seat No.	

Set **S**

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 × 23 and 0 × 01 b) 0 × 23 and 0 × 00
   c) 0 × 23 and 0 × 02 d) 0 × 22 and 0 × 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 × 0000 0002, r4 = 0 × 0000 0001
   LSL r2, r4 results
   a) r2 = 0 × 0000 0004, r4 = 0 × 0000 0001 b) r2 = 0 × 0000 0004, r4 = 0 × 0000 0002
   c) r2 = 0 × 0000 0001, r2 = 0 × 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

P.T.O.

8) Using USB up to _____ devices may be connected to a single host controller.
   a) 2 b) 64 c) 127 d) 256

9) _____ mode is a special version of user mode that allows full read-write access to the cpsr.
   a) Supervisor b) System c) Undefined d) Abort

10) The ARM register _____ is called link register.
   a) R 12 b) R 13 c) R 14 d) R 15

SECTION – II

11) Process is
   a) Program in high level language kept on disk
   b) Content of main memory
   c) A program in execution
   d) A job in secondary memory

12) Which of the following option is not true ?
   a) A signal is boolean notification
   b) A signal and semaphore are of one bit each
   c) A signal and mutex are of one bit each
   d) A signal, a semaphore and a message are of one bit each

13) Real time operating systems can be found in
   a) PDAS b) Scientific instruments
   c) Cell phones d) PDC

14) 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

15) Inter task communication can be done through
   a) Mailbox b) Queue c) Pipes d) All of above

16) Semaphore
   a) Synchronise critical resources to prevent dead lock
   b) Are used to do I/O
   c) Are used for memory management
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   d) None of the above

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   c) not used in multiprogramming system
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19) Medical devices often run a _____ operating system.
   a) Real time b) Single user c) Multi user d) Network

20) Event flags are used when
   a) Task need to synchronise with the occurrence of multiple events
   b) Task need to synchronise with the occurrence of two events
   c) Interprocess communication required
   d) None of above

_____

SLR-EP – 159

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. **(5×4 =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. **(10×2 =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.

SECTION – II

4. Solve **any four** questions. **(5×4 =20)**

   1) Explain application of RTOS.

   2) Explain Kernel Services in an Operating System (RTOS).

   3) Explain Kernel structure of μ 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. **(10×2 =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.

SLR-EP – 468

Seat No.	

Set **P**

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 Type Questions

Duration : 30 Minutes Marks : 20

1. Select an appropriate option : **(20×1=20)**

1) WMAN corresponds to
   a) IEEE 802.11 b) IEEE 802.15
   c) IEEE 802.16 d) None of the above

2) IEEE 802.16 operates over _____ frequency spectrum.
   a) 10 to 66 GHz b) 10 to 66 MHz
   c) 10 to 66 KHz d) None of the above

3) GFSK and FHSS modulation schemes are used in IEEE
   a) 802.15.1 b) 802.15.3
   c) 802.15.4 d) None of the above

4) Bluetooth operates over _____ frequency band.
   a) 2.4 GHz b) 2.4 MHz
   c) 2.4 KHz d) None of the above

5) SONET stands for
   a) Synchronous Optical Network b) Synchronous Original Network
   c) Asynchronous Optical Network d) None of the above

6) LTE stands for
   a) Long Term Evolution b) Large Term Evolution
   c) Long Term Expiry d) Large term Expiry

7) _____ is a standard developed by ANSI for fiber optic networks.
   a) SONET b) SDH
   c) Either (a) or (b) d) Neither (a) nor (b)

8) SDH has defined hierarchy of signals called
   a) STSs b) STMs c) Either (a) or (b) d) Neither (a) nor (b)

P.T.O.

9) SONET defines _____ layers.
   a) Two b) Three c) Four d) Five

10) SONET network topologies can be
   a) Linear b) Ring c) Mesh d) All of the above

11) _____ is to determine spectrum availability and the presence of licensed users.
   a) Spectrum sensing b) Spectrum sharing
   c) Spectrum mobility d) None of the above

12) _____ is to distribute the spectrum holes fairly among the secondary users bearing in mind usage cost.
   a) Spectrum sensing b) Spectrum sharing
   c) Spectrum mobility d) None of the above

13) _____ is to maintain seamless communication requirements during the transition to better spectrum.
   a) Spectrum sensing b) Spectrum sharing
   c) Spectrum mobility d) None of the above

14) Cognitive cycle consists of
   a) Spectrum sharing b) Spectrum sensing
   c) Spectrum mobility d) All of the above

15) In _____ communication, idependent paths between user and base station are generated via introduction of relay channel.
   a) Cooperative b) Correlative c) Congestive d) None of the above

16) In _____ relaying, if signal to noise ratio of signal received at the relay exceeds a ceratin threshold, relay performs decode and forward operation on the message.
   a) Fixed b) Adaptive c) Both (a) and (b) d) None of the above

17) MIMO stands for
   a) Multiple Input Multiple Output b) Multiple Output Multiple Input
   c) Multiple Instructions Multiple Output d) Memory In Memory Out

18) CR stands for
   a) Cognitive Radio b) Cognizent Radio
   c) Correlative Radio d) None of the above

19) _____ can be used for tele-healthcare.
   a) Cognitive Radio b) Cooperative Communications
   c) Both (a) and (b) d) None of the above

20) ITU stands for
   a) International Telecommunication Union
   b) International Territory Union
   c) Indian Telecommunication Union
   d) Indian Territory Union

_____

SLR-EP – 468

Seat No.	

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.

Set P

Set P

SLR-EP – 468

Seat No.	

Set **Q**

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 Type Questions

Duration : 30 Minutes Marks : 20

1. Select an appropriate option : **(20×1=20)**

1) In _____ relaying, if signal to noise ratio of signal received at the relay exceeds a ceratin threshold, relay performs decode and forward operation on the message.
a) Fixed b) Adaptive c) Both (a) and (b) d) None of the above

2) MIMO stands for
a) Multiple Input Multiple Output b) Multiple Output Multiple Input
c) Multiple Instructions Multiple Output d) Memory In Memory Out

3) CR stands for
a) Cognitive Radio b) Cognizent Radio
c) Correlative Radio d) None of the above

4) _____ can be used for tele-healthcare.
a) Cognitive Radio b) Cooperative Communications
c) Both (a) and (b) d) None of the above

5) ITU stands for
a) International Telecommunication Union
b) International Territory Union
c) Indian Telecommunication Union
d) Indian Territory Union

6) WMAN corresponds to
a) IEEE 802.11 b) IEEE 802.15
c) IEEE 802.16 d) None of the above

7) IEEE 802.16 operates over _____ frequency spectrum.
a) 10 to 66 GHz b) 10 to 66 MHz
c) 10 to 66 KHz d) None of the above

8) GFSK and FHSS modulation schemes are used in IEEE
   a) 802.15.1 b) 802.15.3
   c) 802.15.4 d) None of the above

9) Bluetooth operates over _____ frequency band.
   a) 2.4 GHz b) 2.4 MHz
   c) 2.4 KHz d) None of the above

10) SONET stands for
   a) Synchronous Optical Network b) Synchronous Original Network
   c) Asynchronous Optical Network d) None of the above

11) LTE stands for
   a) Long Term Evolution b) Large Term Evolution
   c) Long Term Expiry d) Large term Expiry

12) _____ is a standard developed by ANSI for fiber optic networks.
   a) SONET b) SDH
   c) Either (a) or (b) d) Neither (a) nor (b)

13) SDH has defined hierarchy of signals called
   a) STSs b) STMs c) Either (a) or (b) d) Neither (a) nor (b)

14) SONET defines _____ layers.
   a) Two b) Three c) Four d) Five

15) SONET network topologies can be
   a) Linear b) Ring c) Mesh d) All of the above

16) _____ is to determine spectrum availability and the presence of licensed users.
   a) Spectrum sensing b) Spectrum sharing
   c) Spectrum mobility d) None of the above

17) _____ is to distribute the spectrum holes fairly among the secondary users bearing in mind usage cost.
   a) Spectrum sensing b) Spectrum sharing
   c) Spectrum mobility d) None of the above

18) _____ is to maintain seamless communication requirements during the transition to better spectrum.
   a) Spectrum sensing b) Spectrum sharing
   c) Spectrum mobility d) None of the above

19) Cognitive cycle consists of
   a) Spectrum sharing b) Spectrum sensing
   c) Spectrum mobility d) All of the above

20) In _____ communication, idependent paths between user and base station are generated via introduction of relay channel.
   a) Cooperative b) Correlative c) Congestive d) None of the above

_____

SLR-EP – 468

Seat No.	

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.
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   a) What do you mean by WMAN ? Explain its typical features and enumerate important physical layer parameters of IEEE 802.16.
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   c) Explain transition of IP network to NGN.

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   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.

Set Q

Set Q

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Seat No.	

Set R

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.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Select an appropriate option : **(20×1=20)**

1) _____ is to determine spectrum availability and the presence of licensed users.
   a) Spectrum sensing b) Spectrum sharing
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2) _____ is to distribute the spectrum holes fairly among the secondary users bearing in mind usage cost.
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5) In _____ communication, idependent paths between user and base station are generated via introduction of relay channel.
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P.T.O.

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9) _____ can be used for tele-healthcare.
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   a) Linear b) Ring c) Mesh d) All of the above

_____

SLR-EP – 468

Seat No.	

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.

Set R

Set R

SLR-EP – 468

Seat No.	

Set **S**

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 Type Questions

Duration : 30 Minutes Marks : 20

1. Select an appropriate option : **(20×1=20)**

1) LTE stands for
a) Long Term Evolution b) Large Term Evolution
c) Long Term Expiry d) Large term Expiry

2) _____ is a standard developed by ANSI for fiber optic networks.
a) SONET b) SDH
c) Either (a) or (b) d) Neither (a) nor (b)

3) SDH has defined hierarchy of signals called
a) STSs b) STMs c) Either (a) or (b) d) Neither (a) nor (b)

4) SONET defines _____ layers.
a) Two b) Three c) Four d) Five

5) SONET network topologies can be
a) Linear b) Ring c) Mesh d) All of the above

6) _____ is to determine spectrum availability and the presence of licensed users.
a) Spectrum sensing b) Spectrum sharing
c) Spectrum mobility d) None of the above

7) _____ is to distribute the spectrum holes fairly among the secondary users bearing in mind usage cost.
a) Spectrum sensing b) Spectrum sharing
c) Spectrum mobility d) None of the above

8) _____ is to maintain seamless communication requirements during the transition to better spectrum.
a) Spectrum sensing b) Spectrum sharing
c) Spectrum mobility d) None of the above

P.T.O.

9) Cognitive cycle consists of
   a) Spectrum sharing b) Spectrum sensing
   c) Spectrum mobility d) All of the above

10) In _____ communication, idependent paths between user and base station are generated via introduction of relay channel.
   a) Cooperative b) Correlative c) Congestive d) None of the above

11) In _____ relaying, if signal to noise ratio of signal received at the relay exceeds a ceratin threshold, relay performs decode and forward operation on the message.
   a) Fixed b) Adaptive c) Both (a) and (b) d) None of the above

12) MIMO stands for
   a) Multiple Input Multiple Output b) Multiple Output Multiple Input
   c) Multiple Instructions Multiple Output d) Memory In Memory Out

13) CR stands for
   a) Cognitive Radio b) Cognizent Radio
   c) Correlative Radio d) None of the above

14) _____ can be used for tele-healthcare.
   a) Cognitive Radio b) Cooperative Communications
   c) Both (a) and (b) d) None of the above

15) ITU stands for
   a) International Telecommunication Union
   b) International Territory Union
   c) Indian Telecommunication Union
   d) Indian Territory Union

16) WMAN corresponds to
   a) IEEE 802.11 b) IEEE 802.15
   c) IEEE 802.16 d) None of the above

17) IEEE 802.16 operates over _____ frequency spectrum.
   a) 10 to 66 GHz b) 10 to 66 MHz
   c) 10 to 66 KHz d) None of the above

18) GFSK and FHSS modulation schemes 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 _____ frequency band.
   a) 2.4 GHz b) 2.4 MHz
   c) 2.4 KHz d) None of the above

20) SONET stands for
   a) Synchronous Optical Network b) Synchronous Original Network
   c) Asynchronous Optical Network d) None of the above

_____

SLR-EP – 468

Seat No.	

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.

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   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.

Set S

Set S

SLR-EP – 469

Seat No.	

Set P

B.E. (E & TC) (Part – I) Examination, 2016
IMAGE PROCESSING (Elective – I)

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) 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 : **(1×20=20)**

1) The graph showing no. of occurrence of pixels of K^{th} gray level of an image is nothing but
   a) Plot b) Histogram c) Probability d) Barchart

2) Images of higher contrast can be produced by darkening the gray levels below threshold and brightening the levels above threshold is called
   a) Contrast stretching b) Contrast reduction
   c) Restoration d) None

3) The watershed transform for image segmentation is executed on
   a) The input image directly b) Gradient of input image
   c) Input image after low pass filter d) Input image after contrast streching

4) The transform which is recommended in Baseline JPEG standard is
   a) Random b) DCT c) Walsh d) Wavelet

5) In general compression model the encoder block is _____ the channel block.
   a) Before b) After c) Upside d) Downside

6) Entropy Coding is basically a
   a) Lossless coding which exploits the psycho visual redundancy
   b) Lossy coding which exploits the psycho visual redundancy
   c) Lossless coding which exploits the statistical redundancy
   d) Lossy coding which exploits the statistical redundancy

7) Currently image compression is recognized as an _____ technology.
   a) Enabling b) Disabling c) Both d) None

P.T.O.

8) A biometrics may be
   a) Fingerprint images b) Satellite images
   c) Computer vision d) None

9) Information lost when expressed mathematically is called
   a) Markow b) Finite memory source
   c) Fidelity criteria d) Noiseless theorem

10) The chain code of a boundary depends on the _____ point.
   a) Start b) End c) Middle d) Last

11) In lossless image compression the data reduction is acceptable in many applications, due to
   a) Loss is desirable b) Not desirable
   c) Both d) None

12) Digital images have edges that are
   a) Blur b) Noisy c) Clear d) Both a) and b)

13) What algorithm is used in finger print technology ?
   a) Intensity based algorithm b) Pattern based algorithm
   c) Feature based algorithm d) Recognition algorithm

14) In RGB colour image each pixel resolution is
   a) 8-bit b) 24-bit c) 16-bit d) 4-bit

15) The smallest descendible detail in an image is called
   a) Spatial resolution b) Gray level resolution
   c) Multi-resolution d) None

16) Image function is characterized by
   a) Reflectance component b) Illumination component
   c) Both a) and b) d) None

17) Digitizing the amplitude value of continuous image is called
   a) Quantization b) Sensing the image
   c) Acquisition d) Sampling

18) Statement 1 : A histogram gives the frequency of occurrence of the gray level
   Statement 2 : A histogram is invariant to rotation
   a) Statement 1 and 2 are wrong
   b) Statement 1 is correct and 2 is wrong
   c) Statement 1 and 2 are correct
   d) Statement 2 is correct and 1 is wrong

19) Dilation followed by erosion operation leads to
   a) Closing b) Opening c) Union d) Intersection

20) Which of the following filter will in general have the best performance in enhancing edge in an image ?
   a) Mean filter b) Median filter c) Laplace filter d) Mode filter

SLR-EP – 469

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. **10**

   OR

   ii) Explain dilation and erosion with example. **10**

SECTION – II

4. Solve **any four** from the following : **(5×4=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. **10**

Set P

Set P

SLR-EP – 469

Seat No.	

Set Q

B.E. (E & TC) (Part – I) Examination, 2016
IMAGE PROCESSING (Elective – I)

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) 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 : **(1×20=20)**

1) Image function is characterized by
   a) Reflectance component b) Illumination component
   c) Both a) and b) d) None

2) Digitizing the amplitude value of continuous image is called
   a) Quantization b) Sensing the image
   c) Acquisition d) Sampling

3) Statement 1 : A histogram gives the frequency of occurrence of the gray level
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   a) Statement 1 and 2 are wrong
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5) Which of the following filter will in general have the best performance in enhancing edge in an image ?
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7) Images of higher contrast can be produced by darkening the gray levels below threshold and brightening the levels above threshold is called
   a) Contrast stretching b) Contrast reduction
   c) Restoration d) None

P.T.O.

8) The watershed transform for image segmentation is executed on
   a) The input image directly b) Gradient of input image
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9) The transform which is recommended in Baseline JPEG standard is
   a) Random b) DCT c) Walsh d) Wavelet

10) In general compression model the encoder block is _____ the channel block.
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12) Currently image compression is recognized as an _____ technology.
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14) Information lost when expressed mathematically is called
   a) Markow b) Finite memory source
   c) Fidelity criteria d) Noiseless theorem

15) The chain code of a boundary depends on the _____ point.
   a) Start b) End c) Middle d) Last

16) In lossless image compression the data reduction is acceptable in many applications, due to
   a) Loss is desirable b) Not desirable
   c) Both d) None

17) Digital images have edges that are
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18) What algorithm is used in finger print technology ?
   a) Intensity based algorithm b) Pattern based algorithm
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19) In RGB colour image each pixel resolution is
   a) 8-bit b) 24-bit c) 16-bit d) 4-bit

20) The smallest descendible detail in an image is called
   a) Spatial resolution b) Gray level resolution
   c) Multi-resolution d) None

_____

SLR-EP – 469

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. **10**

   OR

   ii) Explain dilation and erosion with example. **10**

SECTION – II

4. Solve **any four** from the following : **(5×4=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. **10**

Set Q

Set Q

SLR-EP – 469

Seat No.	

Set **R**

B.E. (E & TC) (Part – I) Examination, 2016
IMAGE PROCESSING (Elective – I)

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****.*
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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 : **(1×20=20)**

1) In lossless image compression the data reduction is acceptable in many applications, due to
   a) Loss is desirable b) Not desirable
   c) Both d) None

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5) The smallest descendible detail in an image is called
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6) Image function is characterized by
   a) Reflectance component b) Illumination component
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7) Digitizing the amplitude value of continuous image is called
   a) Quantization b) Sensing the image
   c) Acquisition d) Sampling

P.T.O.

8) Statement 1 : A histogram gives the frequency of occurrence of the gray level
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b) Lossy coding which exploits the psycho visual redundancy
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17) Currently image compression is recognized as an _____ technology.
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18) A biometrics may be
a) Fingerprint images b) Satellite images
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19) Information lost when expressed mathematically is called
a) Markow b) Finite memory source
c) Fidelity criteria d) Noiseless theorem

20) The chain code of a boundary depends on the _____ point.
a) Start b) End c) Middle d) Last

_____

SLR-EP – 469

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.
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   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. **10**

   OR

   ii) Explain dilation and erosion with example. **10**

SECTION – II

4. Solve **any four** from the following : **(5×4=20)**
   i) Explain various image redundancy techniques.
   ii) What is error free compression ?
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   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. **10**

Set R

SLR-EP – 469

Seat No.	

Set S

B.E. (E & TC) (Part – I) Examination, 2016
IMAGE PROCESSING (Elective – I)

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) 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 : **(1×20=20)**

1) Entropy Coding is basically a
   a) Lossless coding which exploits the psycho visual redundancy
   b) Lossy coding which exploits the psycho visual redundancy
   c) Lossless coding which exploits the statistical redundancy
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13) Statement 1 : A histogram gives the frequency of occurrence of the gray level
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   c) Statement 1 and 2 are correct
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14) Dilation followed by erosion operation leads to
   a) Closing b) Opening c) Union d) Intersection

15) Which of the following filter will in general have the best performance in enhancing edge in an image ?
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   a) The input image directly b) Gradient of input image
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19) The transform which is recommended in Baseline JPEG standard is
   a) Random b) DCT c) Walsh d) Wavelet

20) In general compression model the encoder block is _____ the channel block.
   a) Before b) After c) Upside d) Downside

SLR-EP – 469

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. **10**

   OR

   ii) Explain dilation and erosion with example. **10**

SECTION – II

4. Solve **any four** from the following : **(5×4=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. **10**

Set S

Set S

SLR-EP – 470

Seat No.	

Set **P**

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.*
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 : 20

1. Choose the correct answer : **(1×20=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) $N\log_2 N$
   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
   c) Interpolator d) None of the above

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

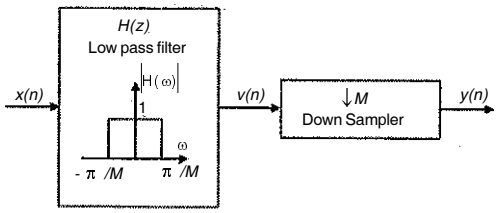
5) The Wiener Hopf equation for the FIR Wiener filter is
   a) $R_x w = r_{dx}$ b) $r_{dx} w = R_x$ c) $r_{dx}^{-1} w = R_x$ d) None

6) 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

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

P.T.O.

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 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) $\frac{3}{4}$

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) $T = H^T$

SLR-EP – 470

Seat No.	

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 : **(4×5=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 : **(2×10=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 : **(4×5=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 : **(2×10=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.

Set P

Set P

SLR-EP – 470

Seat No.	

Set **Q**

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.*
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 : 20

1. Choose the correct answer : **(1×20=20)**

1) Modern day equalization is based on
a) Conventional filter b) Digital filters c) Adaptive filters d) None of these

2) 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

3) MRA equation is also called
a) Modulating equation b) FIR filter
c) Dilation equation d) Span equation

4) In unsampling after every sample placing value is
a) 1 b) 0 c) 2 d) 3

5) Haar transformation is defined by
a) $T = HFH^T$ b) $T = HFH$ c) $T = HF^T$ d) $T = H^T$

6) Wavelet transformation is used for
a) Only audio processing
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c) Both image + audio processing
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7) How many complex multiplications are need to be performed for each FFT algorithm ?
a) (N/2) log N b) $N\log_2 N$
c) $(N/2)\log_2 N$ d) None of the above

8) The increase in sampling rate is referred as
a) Decimation b) Down sampling
c) Interpolator d) None of the above

P.T.O.

9) The power spectrum of a given autocorrelation sequence $r_x(k) = \delta\ (k-1)$ is
   a) z^{-1} b) z
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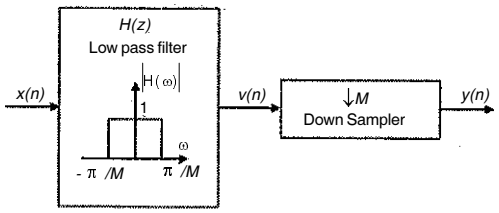
10) The Wiener Hopf equation for the FIR Wiener filter is
   a) $R_x w = r_{dx}$ b) $r_{dx} w = R_x$ c) $r_{dx}^{-1} w = R_x$ d) None

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 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) $\frac{3}{4}$

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   a) Smooth waves missing peaks
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16) AR model is defined for
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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

SLR-EP – 470

Seat No.	

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.*
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SECTION – I

2. Attempt **any four** of the following : **(4×5=20)**
   a) Explain applications of multirate systems.
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   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 : **(2×10=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 : **(4×5=20)**
   a) Explain the relationship between autocorrelation and the model parameter.
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   d) Explain the Burg method for estimation.
   e) Explain Wiener filter theory.

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   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.

Set Q

Set Q

SLR-EP – 470

Seat No.	

Set **R**

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****.*
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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 : **(1×20=20)**

1) AR model is defined for
   a) Non stationary process b) Non white signals
   c) Thermal noise d) None of these

2) Weiner filter is
   a) Conventional filter b) Adaptive filters c) All pole FIR filter d) None of these

3) Which among under given is not true for multirate signal processing ?
   a) Decimation b) Interpolation c) D/I d) None of these

4) 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

5) The principle of orthogonality is used in
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   c) Weiner filtering d) Conventional filtering

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7) Special-purpose processors can be subdivided into many different groups which are
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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
   a) $T = HFH^T$ b) $T = HFH$ c) $T = HF^T$ d) $T = H^T$

P.T.O.

11) Wavelet transformation is used for
   a) Only audio processing
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   a) (N/2) log N
   b) $N\log_2 N$
   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

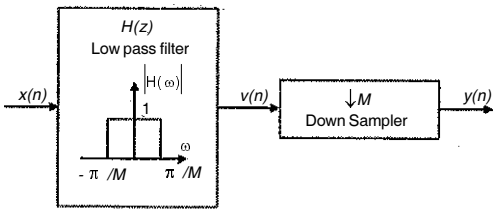
14) The power spectrum of a given autocorrelation sequence $r_x(k) = \delta\ (k-1)$ is
   a) z^{-1}
   b) z
   c) 0
   d) None of the above

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

SLR-EP – 470

Seat No.	

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 : **(4×5=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 : **(2×10=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 : **(4×5=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 : **(2×10=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.

———————

Set R

Set R

SLR-EP – 470

Seat No.	

Set **S**

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.*
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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

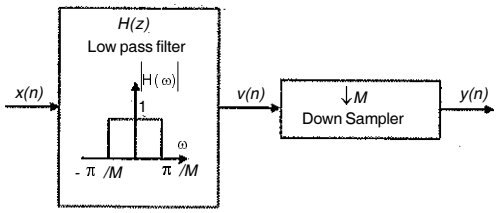
Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(1×20=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 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) $\frac{3}{4}$

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

P.T.O.

6) AR model is defined for
   a) Non stationary process b) Non white signals
   c) Thermal noise d) None of these

7) Weiner filter is
   a) Conventional filter b) Adaptive filters c) All pole FIR filter d) None of these

8) Which among under given is not true for multirate signal processing ?
   a) Decimation b) Interpolation c) D/I d) None of these

9) 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

10) The principle of orthogonality is used in
   a) Multirate signal processing b) Wavelet transformation
   c) Weiner filtering d) Conventional filtering

11) Modern day equalization is based on
   a) Conventional filter b) Digital filters c) Adaptive filters d) None of these

12) Special-purpose processors can be subdivided into many different groups which are
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15) Haar transformation is defined by
   a) $T = HFH^T$ b) $T = HFH$ c) $T = HF^T$ d) $T = H^T$

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19) 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

20) 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

Set S

SLR-EP – 470

Seat No.	

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 : **(4×5=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 : **(2×10=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.
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SECTION – II

4. Attempt **any four** of the following : **(4×5=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 : **(2×10=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.

Set S

Set S

SLR-EP – 471

Seat No.	

Set **P**

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

1. Choose the correct answer : **(20×1=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 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

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_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

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

P.T.O.

8) The decision region for a Parzon window classifier depends upon the choice of
   a) Window name b) Window function
   c) Window width d) None of the above

9) The probability density function for x, given that the nature is w is denoted by
   a) $p(x|w)$ b) $p(w|x)$ c) p(w) d) p(x)

10) The density estimation in which the volume V_n is shrinked according to function $V_n = \frac{1}{\sqrt{n}}$ is called
   a) Kn-nearest neighbor b) Bayesian estimation
   c) Parzen window d) All of the above

11) A well formed cluster has
   a) Compact cloud b) Dispersed cloud
   c) Less cloud d) None of these

12) Triangle in equality is given by
   a) $D(a, b) + D(b, c) \geq D(a, c)$ b) $D(a, b) + D(b, c) = O(a, c)$
   c) $D(a, b) + D(b, c) \leq O(a, c)$ d) $O(a, b) - O(b, c) > O(a, c)$

13) 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

14) In posterior density $p(\theta|D)$ is called
   a) Weight vector b) Threshold vector
   c) Parameter vector d) All of these

15) 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

16) Parzen window method is used for
   a) Estimating error rate b) Estimating nearest neighbor
   c) Estimating density d) All of the above

17) 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

18) 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)

19) The solution vector exists on
   a) Negative side of every hyperplane b) Positive side of every hyperplane
   c) Both sides d) None of the above

20) If the overlapping between component densities of normal mixture is small then the convergence is
   a) Slow b) Fast c) Moderate d) Unchange

SLR-EP – 471

Seat No.	

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** : **(4×6=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** : **(2×8=16)**

a) Explain HMM decoding algorithm.

b) Explain Bayesian parameter estimation for the case where mean μ is the only unknown parameter.

c) Write a note on Bayesian Parameter Estimation.

SECTION – II

4. Attempt **any four** : **(4×6=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** : **(2×8=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.

SLR-EP – 471

Seat No.	

Set **Q**

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

1. Choose the correct answer : **(20×1=20)**

1) Parzen window method is used for
   a) Estimating error rate b) Estimating nearest neighbor
   c) Estimating density d) All of the above

2) 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

3) 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)

4) The solution vector exists on
   a) Negative side of every hyperplane b) Positive side of every hyperplane
   c) Both sides d) None of the above

5) If the overlapping between component densities of normal mixture is small then the convergence is
   a) Slow b) Fast c) Moderate d) Unchange

6) Gaussian density is also known as
   a) Estimation density b) Parameter density
   c) Normal density d) All of the above

7) Which of the following are frequently nearly identical ?
   a) Bayesian, HMM b) HMM, Maximum Likelihood
   c) Newton Descent d) Bayesian Maximum Likelihood

8) 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

P.T.O.

9) 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

10) 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

11) What are the problems of dimensionality ?

a) Accuracy b) Dimension c) Over fitting d) All of the above

12) 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

13) The decision region for a Parzon window classifier depends upon the choice of

a) Window name b) Window function
c) Window width d) None of the above

14) The probability density function for x, given 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 volume V_n is shrinked according to function $V_n = \frac{1}{\sqrt{n}}$ is called

a) Kn-nearest neighbor b) Bayesian estimation
c) Parzen window d) All of the above

16) A well formed cluster has

a) Compact cloud b) Dispersed cloud
c) Less cloud d) None of these

17) Triangle in equality is given by

a) $D(a, b) + D(b, c) \geq D(a, c)$ b) $D(a, b) + D(b, c) = O(a, c)$
c) $D(a, b) + D(b, c) \leq O(a, c)$ d) $O(a, b) - O(b, c) > O(a, c)$

18) In k-means clustering, k refers to

a) The no. of sample points b) The no. of clusters
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19) In posterior density $p(\theta|D)$ is called

a) Weight vector b) Threshold vector
c) Parameter vector d) All of these

20) 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

Set Q

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Seat No.	

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** : **(4×6=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** : **(2×8=16)**

a) Explain HMM decoding algorithm.

b) Explain Bayesian parameter estimation for the case where mean μ is the only unknown parameter.

c) Write a note on Bayesian Parameter Estimation.

SECTION – II

4. Attempt **any four** : **(4×6=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** : **(2×8=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.

SLR-EP – 471

Seat No.	

Set **R**

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.***
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) A well formed cluster has
   a) Compact cloud b) Dispersed cloud
   c) Less cloud d) None of these

2) Triangle in equality is given by
   a) $D(a, b) + D(b, c) \geq D(a, c)$ b) $D(a, b) + D(b, c) = O(a, c)$
   c) $D(a, b) + D(b, c) \leq O(a, c)$ d) $O(a, b) - O(b, c) > O(a, c)$

3) 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

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
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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)

P.T.O.

9) The solution vector exists on
   a) Negative side of every hyperplane b) Positive side of every hyperplane
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12) Which of the following are frequently nearly identical ?
   a) Bayesian, HMM b) HMM, Maximum Likelihood
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14) Squared Mahalanobis distance from x to μ is given by
   a) $r^2 = (x-\mu)^t \sum -1(x-\mu)$ b) $r^2 = (x+\mu)^t \sum -1(x-\mu)$
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15) 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
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16) What are the problems of dimensionality ?
   a) Accuracy b) Dimension c) Over fitting d) All of the above

17) A generalized linear discriminant function is given by
   a) g(x) = ay b) $g(x) = a^t y$
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19) The probability density function for x, given that the nature is w is denoted by
   a) p(x|w) b) p(w|x) c) p(w) d) p(x)

20) The density estimation in which the volume V_n is shrinked according to function $V_n = \frac{1}{\sqrt{n}}$ is called
   a) Kn-nearest neighbor b) Bayesian estimation
   c) Parzen window d) All of the above

Set R

SLR-EP – 471

Seat No.	

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.***
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3) Assume suitable data if ***necessary.***

SECTION – I

2. Attempt **any four** : **(4×6=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** : **(2×8=16)**

a) Explain HMM decoding algorithm.

b) Explain Bayesian parameter estimation for the case where mean μ is the only unknown parameter.

c) Write a note on Bayesian Parameter Estimation.

SECTION – II

4. Attempt **any four** : **(4×6=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** : **(2×8=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.

SLR-EP – 471

Seat No.	

Set **S**

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.*
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3) Assume suitable data if ***required***
4) Figures to the ***right*** *indicate* ***full*** *marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) What are the problems of dimensionality ?
a) Accuracy b) Dimension c) Over fitting d) All of the above

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a) $g(x) = ay$ b) $g(x) = a^t y$
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3) The decision region for a Parzon window classifier depends upon the choice of
a) Window name b) Window function
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8) In k-means clustering, k refers to
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P.T.O.

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14) The solution vector exists on
   a) Negative side of every hyperplane b) Positive side of every hyperplane
   c) Both sides d) None of the above

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   c) Marginal risk d) None of the above

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   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 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

SLR-EP – 471

Seat No.	

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** : **(4×6=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** : **(2×8=16)**

a) Explain HMM decoding algorithm.

b) Explain Bayesian parameter estimation for the case where mean μ is the only unknown parameter.

c) Write a note on Bayesian Parameter Estimation.

SECTION – II

4. Attempt **any four** : **(4×6=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** : **(2×8=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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SLR-EP – 472

Seat No.	

Set P

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 : **(20×1=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 $\underset{\sim}{A}$ is given as

a) $\underset{\sim}{A} = \left\{ \int \frac{\mu_{\underset{\sim}{A}}(x)}{x} \right\}$ b) $\underset{\sim}{A} = \left\{ \frac{d}{dx} \frac{\mu_{\underset{\sim}{A}}(x)}{x} \right\}$

c) $\underset{\sim}{A} = \sum_i \frac{\mu_{\underset{\sim}{A}}(x_i)}{x_i}$ 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) $\left(\underset{\sim}{A} \cup \underset{\sim}{B} \right)_\lambda = A_\lambda \cup B_\lambda$ b) $\left(\underset{\sim}{A} \cup \underset{\sim}{B} \right)_\lambda = \underset{\sim}{A}_\lambda \cap B_\lambda$

c) $\left(\underset{\sim}{A} \cap \underset{\sim}{B} \right)_\lambda = A_\lambda \cup B_\lambda$ 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

P.T.O.

7) Interval arithmetic follows property of
a) Associativity b) Commutativity c) Distributivity d) Both a) and b)

8) Approximate methods of extension mostly used for _____ function.
a) Discrete valued b) Random
c) Continuous d) None

9) Feature analysis components are
a) Nomination b) Selection c) Extraction d) All of these

10) Pattern recognition data is of following type
a) design b) test c) both a) and b) d) a) or b)

11) 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

12) 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)

13) Non-transitive ranking is _____ concepts.
a) Crisp b) Cardinal c) Non-cardinal d) None

14) Physical system under control is called
a) Project b) Process c) Plant d) Sensor

15) With random variables we can quantify the uncertainty in ordering with a _____
a) Convolution differentiation b) Convolutional integral
c) Sum d) None

16) Average certainty in $\underset{\sim}{R}$ is defined as $c\left(\underset{\sim}{R}\right) =$
a) $\frac{tr\left(R^2\right)}{n(n-1)}$ b) $\frac{tr\left(RR^T\right)}{n(n-1)/2}$ c) $\frac{tr(R)}{n(n-1)/2}$ d) None

17) 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

18) In linear programming problem, the function to be minimized or maximized is called
a) Constraint matrix b) Objective function
c) Linear function d) None

19) A common SPC technique use _____ charts.
a) $\overline{X} - R$ b) P c) R d) $X - \overline{R}$

20) Genetic algorithm usually used for _____ solution.
a) Average b) Minimum c) Optimum d) None

_____

SLR-EP – 472

Seat No.	

B.E. (E & TC) (Part – II) Examination, 2016
FUZZY LOGIC (Elective – II) (Old)

Day and Date : Thursday, 24-11-2016 Marks : 80
Time : 3.00 p.m to 6.00 p.m.

SECTION – I

2. Solve **any four** : **(4×5=20)**

a) What is λ 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 $\underset{\sim}{A}$ and $\underset{\sim}{B}$ are represented as follows, find $\overline{\underset{\sim}{A}}$, $\underset{\sim}{A} \mid \underset{\sim}{B}$, $\underset{\sim}{B} \mid A$,

$$\underset{\sim}{A} = \left\{\frac{1}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5}\right\},\ \underset{\sim}{B} = \left\{\frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5}\right\}.$$

e) Explain fuzzy set extension principle.

3. a) Explain fuzzy automata in detail. **(1×10=10)**

b) If $\underset{\sim 1}{R} = \begin{bmatrix} 1 & 0.8 & 0 & 0.1 & 0.2 \\ 0.8 & 1 & 0.4 & 0 & 0.9 \\ 0 & 0.4 & 1 & 0 & 0 \\ 0.1 & 0 & 0 & 1 & 0.5 \\ 0.2 & 0.9 & 0 & 0.5 & 1 \end{bmatrix}$ is reflexive and symmetric . Prove that

$\underset{\sim 1}{R}^4 = R_1 \, 0 \, R_1 \, 0 R_1 \, 0 R_1 = \underset{\sim}{R}$ i.e. 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.

Set P

SECTION – II

4. Answer **any four** : **(4×5=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

$$\underset{\sim}{R} = \begin{bmatrix} 0 & 0.8 & 0.5 & 0.4 \\ 0.2 & 0 & 0.4 & 0.2 \\ 0.5 & 0.6 & 0 & 0.2 \\ 0.6 & 0.8 & 0.8 & 0 \end{bmatrix}$$ determine average fuzziness and average certainty.

(1×10=10)

   b) Explain :

   i) Fuzzy ordering

   ii) Multiobjective decision. **(1×10=10)**

OR

   b) What is SPC ? Explain in detail measurement and attribute SPC.

SLR-EP – 472

Seat No.	

Set Q

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 : **(20×1=20)**

1) Average certainty in $\underset{\sim}{R}$ is defined as $c\left(\underset{\sim}{R}\right) =$

a) $\frac{tr\left(R^2\right)}{n\,(n-1)}$ b) $\frac{tr\left(RR^T\right)}{n\,(n-1)/2}$ c) $\frac{tr\,(R)}{n\,(n-1)/2}$ d) None

2) The optimum decision a*, for multiobjective decision making $\mu_D\,(a^*) =$

a) $\max\limits_{a \in A}\left(\mu_D\,(a)\right)$ b) $\min\limits_{a \in A}\left(\mu_D\,(a)\right)$ 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

7) When the universe X is discrete and finite, then the notation convention for fuzzy set $\underset{\sim}{A}$ is given as

a) $\underset{\sim}{A} = \left\{ \int \frac{\mu_{\underset{\sim}{A}}(x)}{x} \right\}$ b) $\underset{\sim}{A} = \left\{ \frac{d}{dx} \frac{\mu_{\underset{\sim}{A}}(x)}{x} \right\}$ c) $\underset{\sim}{A} = \sum_i \frac{\mu_{\underset{\sim}{A}}(x_i)}{x_i}$ d) None

8) A tolerance relation R is also called as _____ relation.
a) Equivalence b) Proximity c) Both a) and b) d) None

9) Lambda cut obey the property

a) $\left(\underset{\sim}{A} \cup \underset{\sim}{B} \right)_\lambda = A_\lambda \cup B_\lambda$ b) $\left(\underset{\sim}{A} \cup \underset{\sim}{B} \right)_\lambda = \underset{\sim}{A}_\lambda \cap B_\lambda$

c) $\left(\underset{\sim}{A} \cap \underset{\sim}{B} \right)_\lambda = A_\lambda \cup B_\lambda$ d) None

10) Membership value assignment 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

Set Q

_____

SLR-EP – 472

Seat No.	

B.E. (E & TC) (Part – II) Examination, 2016
FUZZY LOGIC (Elective – II) (Old)

Day and Date : Thursday, 24-11-2016 Marks : 80
Time : 3.00 p.m to 6.00 p.m.

SECTION – I

2. Solve **any four** : **(4×5=20)**

a) What is λ 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 $\underset{\sim}{A}$ and $\underset{\sim}{B}$ are represented as follows, find $\overline{\underset{\sim}{A}}$, $\underset{\sim}{A} \mid \underset{\sim}{B}$, $\underset{\sim}{B} \mid A$,

$$\underset{\sim}{A} = \left\{\frac{1}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5}\right\},\ \underset{\sim}{B} = \left\{\frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5}\right\}.$$

e) Explain fuzzy set extension principle.

3. a) Explain fuzzy automata in detail. **(1×10=10)**

b) If $\underset{\sim 1}{R} = \begin{bmatrix} 1 & 0.8 & 0 & 0.1 & 0.2 \\ 0.8 & 1 & 0.4 & 0 & 0.9 \\ 0 & 0.4 & 1 & 0 & 0 \\ 0.1 & 0 & 0 & 1 & 0.5 \\ 0.2 & 0.9 & 0 & 0.5 & 1 \end{bmatrix}$ is reflexive and symmetric . Prove that

$\underset{\sim 1}{R}^4 = R_1 \, 0 \, R_1 \, 0 R_1 \, 0 R_1 = \underset{\sim}{R}$ i.e. 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.

Set Q

SECTION – II

4. Answer **any four** : **(4×5=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

$$\underset{\sim}{R} = \begin{bmatrix} 0 & 0.8 & 0.5 & 0.4 \\ 0.2 & 0 & 0.4 & 0.2 \\ 0.5 & 0.6 & 0 & 0.2 \\ 0.6 & 0.8 & 0.8 & 0 \end{bmatrix}$$ determine average fuzziness and average certainty.

(1×10=10)

   b) Explain :

      i) Fuzzy ordering

      ii) Multiobjective decision. **(1×10=10)**

OR

   b) What is SPC ? Explain in detail measurement and attribute SPC.

SLR-EP – 472

Seat No.	

Set R

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 : **(20×1=20)**

1) 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

2) 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)

3) Non-transitive ranking is _____ concepts.
a) Crisp b) Cardinal c) Non-cardinal d) None

4) Physical system under control is called
a) Project b) Process c) Plant d) Sensor

5) With random variables we can quantify the uncertainty in ordering with a _____
a) Convolution differentiation b) Convolutional integral
c) Sum d) None

6) Average certainty in $\underset{\sim}{R}$ is defined as $c\left(\underset{\sim}{R}\right) =$
a) $\frac{tr\left(R^2\right)}{n\,(n-1)}$ b) $\frac{tr\left(RR^T\right)}{n\,(n-1)/2}$ c) $\frac{tr\,(R)}{n\,(n-1)/2}$ d) None

7) The optimum decision a*, for multiobjective decision making $\mu_D\,(a^*) =$
a) $\max_{a \in A}\left(\mu_D\,(a)\right)$ b) $\min_{a \in A}\left(\mu_D\,(a)\right)$ c) Both a) and b) d) None

P.T.O.

8) In linear programming problem, the function to be minimized or maximized is called
   a) Constraint matrix b) Objective function
   c) Linear function d) None

9) A common SPC technique use _____ charts.
   a) $\overline{X} - R$ b) P c) R d) $X - \overline{R}$

10) Genetic algorithm usually used for _____ solution.
   a) Average b) Minimum c) Optimum d) None

11) 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

12) When the universe X is discrete and finite, then the notation convention for fuzzy set $\underset{\sim}{A}$ is given as
   a) $\underset{\sim}{A} = \left\{ \int \frac{\mu_{\underset{\sim}{A}}(x)}{x} \right\}$ b) $\underset{\sim}{A} = \left\{ \frac{d}{dx} \frac{\mu_{\underset{\sim}{A}}(x)}{x} \right\}$
   c) $\underset{\sim}{A} = \sum_i \frac{\mu_{\underset{\sim}{A}}(x_i)}{x_i}$ d) None

13) A tolerance relation R is also called as _____ relation.
   a) Equivalence b) Proximity c) Both a) and b) d) None

14) Lambda cut obey the property
   a) $\left(\underset{\sim}{A} \cup \underset{\sim}{B}\right)_\lambda = A_\lambda \cup B_\lambda$ b) $\left(\underset{\sim}{A} \cup \underset{\sim}{B}\right)_\lambda = \underset{\sim}{A}_\lambda \cap B_\lambda$
   c) $\left(\underset{\sim}{A} \cap \underset{\sim}{B}\right)_\lambda = A_\lambda \cup B_\lambda$ d) None

15) Membership value assignment includes
   a) Intuition b) Inference c) Rank ordering d) All

16) In inductive reasoning, the membership function can be created as _____ generation.
   a) Manual b) Automatic c) Both a) and b) d) None

17) Interval arithmetic follows property of
   a) Associativity b) Commutativity c) Distributivity d) Both a) and b)

18) Approximate methods of extension mostly used for _____ function.
   a) Discrete valued b) Random
   c) Continuous d) None

19) Feature analysis components are
   a) Nomination b) Selection c) Extraction d) All of these

20) Pattern recognition data is of following type
   a) design b) test c) both a) and b) d) a) or b)

Set R

_____

SLR-EP – 472

Seat No.	

B.E. (E & TC) (Part – II) Examination, 2016
FUZZY LOGIC (Elective – II) (Old)

Day and Date : Thursday, 24-11-2016 Marks : 80
Time : 3.00 p.m to 6.00 p.m.

SECTION – I

2. Solve **any four** : **(4×5=20)**

a) What is λ 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 $\underset{\sim}{A}$ and $\underset{\sim}{B}$ are represented as follows, find $\overline{\underset{\sim}{A}}$, $\underset{\sim}{A} \mid \underset{\sim}{B}$, $\underset{\sim}{B} \mid A$,

$$\underset{\sim}{A} = \left\{\frac{1}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5}\right\},\ \underset{\sim}{B} = \left\{\frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5}\right\}.$$

e) Explain fuzzy set extension principle.

3. a) Explain fuzzy automata in detail. **(1×10=10)**

b) If $\underset{\sim 1}{R} = \begin{bmatrix} 1 & 0.8 & 0 & 0.1 & 0.2 \\ 0.8 & 1 & 0.4 & 0 & 0.9 \\ 0 & 0.4 & 1 & 0 & 0 \\ 0.1 & 0 & 0 & 1 & 0.5 \\ 0.2 & 0.9 & 0 & 0.5 & 1 \end{bmatrix}$ is reflexive and symmetric . Prove that

$\underset{\sim 1}{R}^4 = R_1 \, 0 \, R_1 \, 0 R_1 \, 0 R_1 = \underset{\sim}{R}$ i.e. 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.

Set R

SECTION – II

4. Answer **any four** : **(4×5=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

$$\underset{\sim}{R} = \begin{bmatrix} 0 & 0.8 & 0.5 & 0.4 \\ 0.2 & 0 & 0.4 & 0.2 \\ 0.5 & 0.6 & 0 & 0.2 \\ 0.6 & 0.8 & 0.8 & 0 \end{bmatrix}$$ determine average fuzziness and average certainty.

(1×10=10)

   b) Explain :

   i) Fuzzy ordering

   ii) Multiobjective decision. **(1×10=10)**

OR

   b) What is SPC ? Explain in detail measurement and attribute SPC.

SLR-EP – 472

Seat No.	

Set S

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 : **(20×1=20)**

1) In inductive reasoning, the membership function can be created as _____ generation.
a) Manual b) Automatic c) Both a) and b) d) None

2) Interval arithmetic follows property of
a) Associativity b) Commutativity c) Distributivity d) Both a) and b)

3) Approximate methods of extension mostly used for _____ function.
a) Discrete valued b) Random
c) Continuous d) None

4) Feature analysis components are
a) Nomination b) Selection c) Extraction d) All of these

5) Pattern recognition data is of following type
a) design b) test c) both a) and b) d) a) or b)

6) 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

7) 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)

8) Non-transitive ranking is _____ concepts.
a) Crisp b) Cardinal c) Non-cardinal d) None

9) Physical system under control is called
a) Project b) Process c) Plant d) Sensor

10) With random variables we can quantify the uncertainty in ordering with a _____
a) Convolution differentiation b) Convolutional integral
c) Sum d) None

11) Average certainty in $\underset{\sim}{R}$ is defined as $c\left(\underset{\sim}{R}\right) =$
a) $\frac{tr\left(R^2\right)}{n(n-1)}$ b) $\frac{tr\left(RR^T\right)}{n(n-1)/2}$ c) $\frac{tr(R)}{n(n-1)/2}$ d) None

12) 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

13) In linear programming problem, the function to be minimized or maximized is called
a) Constraint matrix b) Objective function
c) Linear function d) None

14) A common SPC technique use _____ charts.
a) $\overline{X} - R$ b) P c) R d) $X - \overline{R}$

15) Genetic algorithm usually used for _____ solution.
a) Average b) Minimum c) Optimum d) None

16) 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

17) When the universe X is discrete and finite, then the notation convention for fuzzy set $\underset{\sim}{A}$ is given as
a) $\underset{\sim}{A} = \left\{ \int \frac{\mu_{\underset{\sim}{A}}(x)}{x} \right\}$ b) $\underset{\sim}{A} = \left\{ \frac{d}{dx} \frac{\mu_{\underset{\sim}{A}}(x)}{x} \right\}$
c) $\underset{\sim}{A} = \sum_i \frac{\mu_{\underset{\sim}{A}}(x_i)}{x_i}$ d) None

18) A tolerance relation R is also called as _____ relation.
a) Equivalence b) Proximity c) Both a) and b) d) None

19) Lambda cut obey the property
a) $\left(\underset{\sim}{A} \cup \underset{\sim}{B}\right)_\lambda = A_\lambda \cup B_\lambda$ b) $\left(\underset{\sim}{A} \cup \underset{\sim}{B}\right)_\lambda = \underset{\sim}{A}_\lambda \cap B_\lambda$
c) $\left(\underset{\sim}{A} \cap \underset{\sim}{B}\right)_\lambda = A_\lambda \cup B_\lambda$ d) None

20) Membership value assignment includes
a) Intuition b) Inference c) Rank ordering d) All

_____

SLR-EP – 472

Seat No.	

B.E. (E & TC) (Part – II) Examination, 2016
FUZZY LOGIC (Elective – II) (Old)

Day and Date : Thursday, 24-11-2016 Marks : 80
Time : 3.00 p.m to 6.00 p.m.

SECTION – I

2. Solve **any four** : **(4×5=20)**

a) What is λ 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 $\underset{\sim}{A}$ and $\underset{\sim}{B}$ are represented as follows, find $\overline{\underset{\sim}{A}}$, $\underset{\sim}{A} \mid \underset{\sim}{B}$, $\underset{\sim}{B} \mid A$,

$$\underset{\sim}{A} = \left\{\frac{1}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5}\right\},\ \underset{\sim}{B} = \left\{\frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5}\right\}.$$

e) Explain fuzzy set extension principle.

3. a) Explain fuzzy automata in detail. **(1×10=10)**

b) If $\underset{\sim 1}{R} = \begin{bmatrix} 1 & 0.8 & 0 & 0.1 & 0.2 \\ 0.8 & 1 & 0.4 & 0 & 0.9 \\ 0 & 0.4 & 1 & 0 & 0 \\ 0.1 & 0 & 0 & 1 & 0.5 \\ 0.2 & 0.9 & 0 & 0.5 & 1 \end{bmatrix}$ is reflexive and symmetric . Prove that

$\underset{\sim 1}{R}^4 = R_1 \, 0 \, R_1 \, 0 R_1 \, 0 R_1 = \underset{\sim}{R}$ i.e. 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.

Set S

SECTION – II

4. Answer **any four** : **(4×5=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

$$\underset{\sim}{R} = \begin{bmatrix} 0 & 0.8 & 0.5 & 0.4 \\ 0.2 & 0 & 0.4 & 0.2 \\ 0.5 & 0.6 & 0 & 0.2 \\ 0.6 & 0.8 & 0.8 & 0 \end{bmatrix}$$ determine average fuzziness and average certainty.

(1×10=10)

   b) Explain :

   i) Fuzzy ordering

   ii) Multiobjective decision. **(1×10=10)**

OR

   b) What is SPC ? Explain in detail measurement and attribute SPC.

SLR-EP – 473

Seat No.	

Set P

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
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

Duration : 30 Minutes Marks : 20

1. Choose the correct alternative : **(20×1=20)**

1) Only data ADSP-21061 is _____ bit processor.
a) 8 b) 16 c) 32 d) 64

2) The AR ALU (ARALU) performs _____ arithmetic on _____ numbers.
a) Unsigned, 16 b) Signed, 16 c) Signed, 32 d) Unsigned, 32

3) The TMS 320C6X generation of DSPs is based on _____ architecture.
a) VelociTI b) Velocity c) Velocit d) None

4) The ARALU stands for
a) Ancillary Register ALU b) Auxiliary Register ALU
c) Anchor Register ALU d) None

5) SRAM and integrated input output peripherals in ADSP-21061 are
a) Single ported b) Dual ported
c) Single/dual ported d) Both a) and c)

6) The TMS320C6X is _____ processor.
a) Floating point b) Fixed point
c) Floating/fixed point d) All above

7) The multipliers multiply _____ × _____ numbers.
a) 16, 16 b) 17, 17 c) 24, 24 d) 32, 32

P.T.O.

8) The No. of 32 bit general purpose registers in C6X is
   a) 4 b) 8 c) 16 d) 32

9) The register used for which holds the address of the current data memory page is
   a) DP b) ARP c) ARB d) None

10) The 320C54 DSP are said to have advanced Harvard architecture because
   a) They have separate memory bus structure for data and program
   b) They have instruction the enable data transfer between the program and data
   c) They have same memory bus structure for data and program
   d) The contents of program memory cannot copy into data memory or vice versa

11) _____ independent buses for dual data fetch, instruction fetch and nonintrusive I/O.
   a) 4 b) 8 c) 6 d) 16

12) The _____ permits execution of logical operation on data without affecting the contents of ACC.
   a) Parallel logic unit b) Auxiliary ALU
   c) Central ALU d) None

13) L1P and L1D caches are each of _____ K-word length.
   a) 8 b) 16 c) 4 d) 64

14) The C6X pipeline requires _____ phases in fetch stage.
   a) 2 b) 4 c) 5 d) 6

15) The result of operation performed in central ALU are stored into
   a) ACC b) ACCB c) TREG0 d) PREG

16) The C6X pipeline requires _____ phases in decode stage.
   a) 2 b) 24 c) 5 d) 6

17) DSP processors can be used to implement _____ application.
   a) Image processing b) Video processing
   c) Signal processing d) All above

18) In TMS320C6X internal memory is organized as
   a) Separate program and data b) Not separate program and data
   c) Only program d) Only data

19) 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

20) The L2 cache of _____ K word is shared by both program and data memory space.
   a) 4 b) 8 c) 16 d) 64

_____

SLR-EP – 473

Seat No.	

B.E. (Electronics and Telecommunication) (Part – II) (Old) Examination, 2016
Elective – II : DSP PROCESSORS AND APPLICATION

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** : **(5×4=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** : **(10×2=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** : **(5×4=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** : **(10×2=20)**
   1) Draw and explain TMS320C6X CPU data paths.
   2) Explain internal architecture of TMS320C6X processor.
   3) Explain the C6X pipeline operation in detail.

Set P

Set P

SLR-EP – 473

Seat No.	

Set Q

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
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

Duration : 30 Minutes Marks : 20

1. Choose the correct alternative : **(20×1=20)**

1) The C6X pipeline requires _____ phases in decode stage.
a) 2 b) 24 c) 5 d) 6

2) DSP processors can be used to implement _____ application.
a) Image processing b) Video processing
c) Signal processing d) All above

3) In TMS320C6X internal memory is organized as
a) Separate program and data b) Not separate program and data
c) Only program d) Only data

4) 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

5) The L2 cache of _____ K word is shared by both program and data memory space.
a) 4 b) 8 c) 16 d) 64

6) Only data ADSP-21061 is _____ bit processor.
a) 8 b) 16 c) 32 d) 64

P.T.O.

7) The AR ALU (ARALU) performs _____ arithmetic on _____ numbers.
   a) Unsigned, 16 b) Signed, 16 c) Signed, 32 d) Unsigned, 32

8) The TMS 320C6X generation of DSPs is based on _____ architecture.
   a) VelociTI b) Velocity c) Velocit d) None

9) The ARALU stands for
   a) Ancillary Register ALU b) Auxiliary Register ALU
   c) Anchor Register ALU d) None

10) SRAM and integrated input output peripherals in ADSP-21061 are
   a) Single ported b) Dual ported
   c) Single/dual ported d) Both a) and c)

11) The TMS320C6X is _____ processor.
   a) Floating point b) Fixed point
   c) Floating/fixed point d) All above

12) The multipliers multiply _____ × _____ numbers.
   a) 16, 16 b) 17, 17 c) 24, 24 d) 32, 32

13) The No. of 32 bit general purpose registers in C6X is
   a) 4 b) 8 c) 16 d) 32

14) The register used for which holds the address of the current data memory page is
   a) DP b) ARP c) ARB d) None

15) The 320C54 DSP are said to have advanced Harvard architecture because
   a) They have separate memory bus structure for data and program
   b) They have instruction the enable data transfer between the program and data
   c) They have same memory bus structure for data and program
   d) The contents of program memory cannot copy into data memory or vice versa

16) _____ independent buses for dual data fetch, instruction fetch and nonintrusive I/O.
   a) 4 b) 8 c) 6 d) 16

17) The _____ permits execution of logical operation on data without affecting the contents of ACC.
   a) Parallel logic unit b) Auxiliary ALU
   c) Central ALU d) None

18) L1P and L1D caches are each of _____ K-word length.
   a) 8 b) 16 c) 4 d) 64

19) The C6X pipeline requires _____ phases in fetch stage.
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20) The result of operation performed in central ALU are stored into
   a) ACC b) ACCB c) TREG0 d) PREG

_____

SLR-EP – 473

Seat No.	

B.E. (Electronics and Telecommunication) (Part – II) (Old) Examination, 2016
Elective – II : DSP PROCESSORS AND APPLICATION

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**.*
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SECTION – I

2. Attempt **any four** : **(5×4=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** : **(10×2=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** : **(5×4=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** : **(10×2=20)**
   1) Draw and explain TMS320C6X CPU data paths.
   2) Explain internal architecture of TMS320C6X processor.
   3) Explain the C6X pipeline operation in detail.

Set Q

Set Q

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Seat 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
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct alternative : **(20×1=20)**

1) _____ independent buses for dual data fetch, instruction fetch and nonintrusive I/O.
a) 4 b) 8 c) 6 d) 16

2) The _____ permits execution of logical operation on data without affecting the contents of ACC.
a) Parallel logic unit b) Auxiliary ALU
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3) L1P and L1D caches are each of _____ K-word length.
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4) The C6X pipeline requires _____ phases in fetch stage.
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P.T.O.

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13) The TMS 320C6X generation of DSPs is based on _____ architecture.
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14) The ARALU stands for
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_____

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Seat No.	

B.E. (Electronics and Telecommunication) (Part – II) (Old) Examination, 2016
Elective – II : DSP PROCESSORS AND APPLICATION

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****.*
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SECTION – I

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   5) What are different buses of TMS 320C54X and their functions ?
3. Attempt **any two** : **(10×2=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** : **(5×4=20)**
   1) Draw cache configuration register (CCFG).
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   5) Explain FIR implementation using TMS 320C6X DSP processor.
5. Attempt **any two** : **(10×2=20)**
   1) Draw and explain TMS320C6X CPU data paths.
   2) Explain internal architecture of TMS320C6X processor.
   3) Explain the C6X pipeline operation in detail.

Set R

Set R

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Seat No.	

Set S

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

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*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 alternative : **(20×1=20)**

1) The TMS320C6X is _____ processor.
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c) Floating/fixed point d) All above

2) The multipliers multiply _____ × _____ numbers.
a) 16, 16 b) 17, 17 c) 24, 24 d) 32, 32

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c) Central ALU d) None

P.T.O.

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   d) All above

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   a) VelociTI b) Velocity c) Velocit d) None

19) The ARALU stands for
   a) Ancillary Register ALU b) Auxiliary Register ALU
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   a) Single ported b) Dual ported
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_____

SLR-EP – 473

Seat No.	

B.E. (Electronics and Telecommunication) (Part – II) (Old) Examination, 2016
Elective – II : DSP PROCESSORS AND APPLICATION

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****.*
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SECTION – I

2. Attempt **any four** : **(5×4=20)**
   1) Explain about fixed point DSP processors.
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3. Attempt **any two** : **(10×2=20)**
   1) Draw the architecture of ADSP-21061 and explain in detail.
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SECTION – II

4. Attempt **any four** : **(5×4=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** : **(10×2=20)**
   1) Draw and explain TMS320C6X CPU data paths.
   2) Explain internal architecture of TMS320C6X processor.
   3) Explain the C6X pipeline operation in detail.

Set S

Set S

SLR-EP – 474

Seat No.	

Set P

B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016
Elective – II : WIRELESS SENSOR NETWORKS

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 : **(20×1=20)**

1) _____ is a basic unit with on board sensors, processor, memory, wireless modem and power supply.
a) Sensor b) Sensor node c) Routing d) None of the above

2) Sensor network is subject to a unique set of resource constraints such as
a) Finite on board battery power b) Limited n/w connection bandwidth
c) Both a) and b) d) None of the above

3) Advantage of sensor network is
a) Energy b) Detection c) Both a) and b) d) None of the above

4) In wireless adhoc network
a) Access point is not required b) Access point is required
c) Nodes are not required d) None of the above

5) The network in which all the nodes are symmetric and there is no central control or hierarchy is
a) MANET b) Client Server Technology
c) Peer to Peer d) None of the above

6) In single node architecture, following hardware component is used
a) Controller and memory b) Communication device
c) Sensors/Actuators d) All of the above

7) Design and optimization goal for WSNs is
a) QoS support b) Energy efficiency
c) Scalability d) All of above

8) In sensor network, _____ layers are required.
a) Application, Transport, Network, Data link and Physical
b) Presentation, Session, Network, Data link and Physical
c) Presentation, Session, Application, Data link and Physical
d) None of above

9) PSFQ stands for
   a) Pump Slow Fetch Quick b) Pump Start Fetch Quick
   c) Both a) and b) d) None of the above

10) Efficient and time synchronization protocols are necessary to reduce the _____ and _____
   a) Latency error and jitters b) SNR and jitter
   c) Cross connection and jitter d) None of the above

11) MAC stands for
   a) Medium Access Control b) Medium Action Control
   c) Medium Access Character d) None of the above

12) _____ MAC protocol is widely used in modern cellular communication systems.
   a) TDMA b) FDMA c) CDMA d) All of the above

13) _____ is the basic task of all MAC protocols.
   a) Collision avoidance b) Energy efficiency
   c) Scalability d) None of the above

14) Main role of time synchronization in distributed networks is to
   a) Ensure common time scale for all network nodes
   b) Provide right temporal co-ordination among all nodes
   c) Both a) and b)
   d) None of the above

15) BS stands for
   a) Base station b) Base service c) Best station d) None of the above

16) Clustering in WSN contribute to
   a) System scalability b) Life time
   c) Energy efficiency d) All of the above

17) _____ routing is an efficient way to lower energy consumption within a cluster.
   a) Hierarchical b) Hybrid c) Smart d) None of the above

18) _____ tags have a transmitter and their own power source.
   a) Active RFID b) Passive RFID c) Both a) and b) d) None of the above

19) RFID stands for
   a) Radio frequency identification b) Radio first identification
   c) Both a) and b) d) None of the above

20) _____ key element is involved in physical aspects of antennas in energy harvesting.
   a) Antenna gain b) Reflection coefficients
   c) Polarization d) All of the above

SLR-EP – 474

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016
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.

Set P

Set P

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Seat No.	

Set Q

B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016
Elective – II : WIRELESS SENSOR NETWORKS

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.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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   a) Base station b) Base service c) Best station d) None of the above

SLR-EP – 474

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016
Elective – II : WIRELESS SENSOR NETWORKS

Day and Date : Thursday, 24-11-2016 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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   a) Explain the concept of low duty cycle in MAC protocol.
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   e) Explain any one connection based protocol.

5 Solve **any two** of the following : **20**
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   b) Explain RFID Physical Layer Design Automation.
   c) Explain the application of RFID in identification and data capture.

Set Q

Set Q

SLR-EP – 474

Seat No.	

Set R

B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016
Elective – II : WIRELESS SENSOR NETWORKS

Day and Date : Thursday, 24-11-2016 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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5) BS stands for
   a) Base station b) Base service c) Best station d) None of the above

6) Clustering in WSN contribute to
   a) System scalability b) Life time
   c) Energy efficiency d) All of the above

7) _____ routing is an efficient way to lower energy consumption within a cluster.
   a) Hierarchical b) Hybrid c) Smart d) None of the above

8) _____ tags have a transmitter and their own power source.
a) Active RFID b) Passive RFID c) Both a) and b) d) None of the above

9) RFID stands for
a) Radio frequency identification b) Radio first identification
c) Both a) and b) d) None of the above

10) _____ key element is involved in physical aspects of antennas in energy harvesting.
a) Antenna gain b) Reflection coefficients
c) Polarization d) All of the above

11) _____ is a basic unit with on board sensors, processor, memory, wireless modem and power supply.
a) Sensor b) Sensor node c) Routing d) None of the above

12) Sensor network is subject to a unique set of resource constraints such as
a) Finite on board battery power b) Limited n/w connection bandwidth
c) Both a) and b) d) None of the above

13) Advantage of sensor network is
a) Energy b) Detection c) Both a) and b) d) None of the above

14) In wireless adhoc network
a) Access point is not required b) Access point is required
c) Nodes are not required d) None of the above

15) The network in which all the nodes are symmetric and there is no central control or hierarchy is
a) MANET b) Client Server Technology
c) Peer to Peer d) None of the above

16) In single node architecture, following hardware component is used
a) Controller and memory b) Communication device
c) Sensors/Actuators d) All of the above

17) Design and optimization goal for WSNs is
a) QoS support b) Energy efficiency
c) Scalability d) All of above

18) In sensor network, _____ layers are required.
a) Application, Transport, Network, Data link and Physical
b) Presentation, Session, Network, Data link and Physical
c) Presentation, Session, Application, Data link and Physical
d) None of above

19) PSFQ stands for
a) Pump Slow Fetch Quick b) Pump Start Fetch Quick
c) Both a) and b) d) None of the above

20) Efficient and time synchronization protocols are necessary to reduce the _____ and _____
a) Latency error and jitters b) SNR and jitter
c) Cross connection and jitter d) None of the above

_____

SLR-EP – 474

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016
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.

Set R

Set R

SLR-EP – 474

Seat No.	

Set S

B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016
Elective – II : WIRELESS SENSOR NETWORKS

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 : **(20×1=20)**

1) In single node architecture, following hardware component is used
   a) Controller and memory b) Communication device
   c) Sensors/Actuators d) All of the above

2) Design and optimization goal for WSNs is
   a) QoS support b) Energy efficiency
   c) Scalability d) All of above

3) In sensor network, _____ layers are required.
   a) Application, Transport, Network, Data link and Physical
   b) Presentation, Session, Network, Data link and Physical
   c) Presentation, Session, Application, Data link and Physical
   d) None of above

4) PSFQ stands for
   a) Pump Slow Fetch Quick b) Pump Start Fetch Quick
   c) Both a) and b) d) None of the above

5) Efficient and time synchronization protocols are necessary to reduce the _____ and _____
   a) Latency error and jitters b) SNR and jitter
   c) Cross connection and jitter d) None of the above

6) MAC stands for
   a) Medium Access Control b) Medium Action Control
   c) Medium Access Character d) None of the above

7) _____ MAC protocol is widely used in modern cellular communication systems.
   a) TDMA b) FDMA c) CDMA d) All of the above

8) _____ is the basic task of all MAC protocols.
   a) Collision avoidance b) Energy efficiency
   c) Scalability d) None of the above

9) Main role of time synchronization in distributed networks is to
   a) Ensure common time scale for all network nodes
   b) Provide right temporal co-ordination among all nodes
   c) Both a) and b)
   d) None of the above

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 b) Life time
   c) Energy efficiency d) All of the above

12) _____ routing is an efficient way to lower energy consumption within a cluster.
   a) Hierarchical b) Hybrid c) Smart d) None of the above

13) _____ tags have a transmitter and their own power source.
   a) Active RFID b) Passive RFID c) Both a) and b) d) None of the above

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   a) Radio frequency identification b) Radio first identification
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15) _____ key element is involved in physical aspects of antennas in energy harvesting.
   a) Antenna gain b) Reflection coefficients
   c) Polarization d) All of the above

16) _____ is a basic unit with on board sensors, processor, memory, wireless modem and power supply.
   a) Sensor b) Sensor node c) Routing d) None of the above

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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 b) Access point is required
   c) Nodes are not required d) None of the above

20) The network in which all the nodes are symmetric and there is no central control or hierarchy is
   a) MANET b) Client Server Technology
   c) Peer to Peer d) None of the above

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SLR-EP – 474

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016
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.

Set S

SLR-EP – 475

Seat No.	

Set **P**

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) 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 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

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_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

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

P.T.O.

9) 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)

10) 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

11) Parzen window method is used for
   a) Estimating error rate b) Estimating nearest neighbour
   c) Estimating density d) All of the above

12) If the sequence has the property that wherever 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

13) A procedure in which means tend to move so as to minimize a squared-error criterion function is called
   a) K-means clustering b) Bayes learning
   c) Hierarchical clustering d) None of these

14) If the distance between two samples is significantly large, then they correspond to
   a) Same cluster b) Different cluster
   c) Either a) or b) d) None of these

15) The representation of hierarchical clustering in a tree form is called
   a) Graph b) Binary tree c) Dendrogram d) None of these

16) An act of taking in raw data and taking the action based on the 'Category' of the pattern is known as
   a) Image Processing b) Pattern Recognition
   c) Signal Processing d) None of the above

17) For the 'Salmon' and 'Sea bass' fish example length alone is a _____ factor.
   a) Poor b) Strong
   c) Not practicable d) None of the above

18) 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

19) If X and Y are discrete Random Variables and they are Independent then
   a) f(x, y) = f1 (x) b) f (x, y) = f2 (x)
   c) f (x, y) = f1 (x) f2 (y) d) None of the above

20) The shape of the cluster is determined by
   a) Mean vector b) Covariance matrix
   c) Both a) and b) d) None of the above

_____

SLR-EP – 475

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** : **(4×6=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** : **(2×8=16)**
   a) The joint probability function of two random variables X and Y is given by

   $$f(x,y) = c(x^2 + 2y), \quad x = 0,1,2,\ y = 1,2,3,4$$
   $$= 0 \quad , \quad \text{otherwise}$$

   Find : a) the value of c,
   b) P (X = 2, Y = 3),
   c) P ($X \leq 1$, 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** : **(4×6=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** : **(2×8=16)**
   a) How linear classifiers are trained using relaxation procedure ?
   b) Explain Syntactic pattern recognition in brief.
   c) Explain scatter criteria for clustering.

Set P

Set P

SLR-EP – 475

Seat No.	

Set **Q**

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) 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)

2) If a and b are vectors, the symmetry property is given as
   a) D (a, b) ≥ 0 b) D (a, b) = 0
   c) D (a, b) = D (b, a) d) All of the above

3) 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

4) HMM have found greatest use in
   a) Character recognition b) Speech recognition
   c) Gesture recognition d) Both b) and c)

5) 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

6) 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

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 only two categories is called
   a) Dichotomizer b) Trichomizer c) Economizer d) Chotomizer

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   a) Minimum-error-rate classifier b) Linear machine
   c) Hidden Markov model d) All of the above

11) If X and Y are discrete Random Variables and they are Independent then
   a) f(x, y) = f1 (x) b) f (x, y) = f2 (x)
   c) f (x, y) = f1 (x) f2 (y) d) None of the above

12) The shape of the cluster is determined by
   a) Mean vector b) Covariance matrix
   c) Both a) and b) d) None of the above

13) The representation of hierarchical clustering in a tree form is called
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15) A procedure in which means tend to move so as to minimize a squared-error criterion function is called
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16) If the distance between two samples is significantly large, then they correspond to
   a) Same cluster b) Different cluster
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17) Parzen window method is used for
   a) Estimating error rate b) Estimating nearest neighbour
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18) If the sequence has the property that wherever 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

19) For the 'Salmon' and 'Sea bass' fish example length alone is a _____ factor.
   a) Poor b) Strong
   c) Not practicable d) None of the above

20) 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

SLR-EP – 475

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** : **(4×6=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** : **(2×8=16)**
   a) The joint probability function of two random variables X and Y is given by

   $$f(x,y) = c(x^2 + 2y), \quad x = 0,1,2,\ y = 1,2,3,4$$
   $$= 0 \quad , \quad \text{otherwise}$$

   Find : a) the value of c,
   b) P (X = 2, Y = 3),
   c) P ($X \leq 1$, 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** : **(4×6=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** : **(2×8=16)**
   a) How linear classifiers are trained using relaxation procedure ?
   b) Explain Syntactic pattern recognition in brief.
   c) Explain scatter criteria for clustering.

Set Q

Set Q

SLR-EP – 475

Seat No.	

Set **R**

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) Classifier that places a pattern in one of only two categories is called
a) Dichotomizer b) Trichomizer c) Economizer d) Chotomizer

2) A classifier that uses linear discriminant functions is called
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7) 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
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P.T.O.

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   c) f (x, y) = f1 (x) f2 (y) d) None of the above

16) The shape of the cluster is determined by
   a) Mean vector b) Covariance matrix
   c) Both a) and b) d) None of the above

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_____

SLR-EP – 475

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** : **(4×6=24)**
   a) Mention and explain sources of classification error.
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   Find : a) the value of c,
   b) P (X = 2, Y = 3),
   c) P ($X \leq 1$, 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** : **(4×6=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** : **(2×8=16)**
   a) How linear classifiers are trained using relaxation procedure ?
   b) Explain Syntactic pattern recognition in brief.
   c) Explain scatter criteria for clustering.

Set R

Set R

SLR-EP – 475

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) ≥ 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 $(\alpha_{i|}\, x)$ is called the
   a) Conditional risk b) Joint risk
   c) Marginal risk d) None of the above

8) Squared Mahalanobis distance from x to 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

9) Gaussian density is also known as
   a) Estimation density b) Parameter density
   c) Normal density d) All of the above

10) Which of the following are frequently nearly identical ?
   a) Bayesian, HMM b) HMM, Maximum Likelihood
   c) Newton descent d) Bayesian, Maximum Likelihood

11) The representation of hierarchical clustering in a tree form is called
   a) Graph b) Binary tree c) Dendrogram d) None of these

12) An act of taking in raw data and taking the action based on the 'Category' of the pattern is known as
   a) Image Processing b) Pattern Recognition
   c) Signal Processing d) None of the above

13) If X and Y are discrete Random Variables and they are Independent then
   a) f(x, y) = f1 (x) b) f (x, y) = f2 (x)
   c) f (x, y) = f1 (x) f2 (y) d) None of the above

14) The shape of the cluster is determined by
   a) Mean vector b) Covariance matrix
   c) Both a) and b) d) None of the above

15) For the 'Salmon' and 'Sea bass' fish example length alone is a _____ factor.
   a) Poor b) Strong
   c) Not practicable d) None of the above

16) 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

17) A procedure in which means tend to move so as to minimize a squared-error criterion function is called
   a) K-means clustering b) Bayes learning
   c) Hierarchical clustering d) None of these

18) If the distance between two samples is significantly large, then they correspond to
   a) Same cluster b) Different cluster
   c) Either a) or b) d) None of these

19) Parzen window method is used for
   a) Estimating error rate b) Estimating nearest neighbour
   c) Estimating density d) All of the above

20) If the sequence has the property that wherever 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

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SLR-EP – 475

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** : **(4×6=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** : **(2×8=16)**
   a) The joint probability function of two random variables X and Y is given by

   $$f(x,y) = c(x^2+2y), \quad x = 0,1,2,\ y = 1,2,3,4$$
   $$= 0 \quad , \quad \text{otherwise}$$

   Find : a) the value of c,
   b) P (X = 2, Y = 3),
   c) P ($X \leq 1$, 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** : **(4×6=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** : **(2×8=16)**
   a) How linear classifiers are trained using relaxation procedure ?
   b) Explain Syntactic pattern recognition in brief.
   c) Explain scatter criteria for clustering.

Set S

Set S

SLR-EP – 476

Seat No.	

Set **P**

B.E. (Electronics and Telecommunication) (Part – II) Examination, 2016
(Elective – II) DSP PROCESSORS AND APPLICATION (New)

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 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 TMS320C6X is _____ processor.
   a) Floating point b) Fixed point
   c) Floating/fixed point d) All above

2) The AR ALU (ARAU) performs_____ arithmetic on_____ numbers.
   a) Unsigned, 16 b) Singed, 16 c) Signed, 32 d) Unsigned, 32

3) The C6X pipeline requires_____ phases in fetch stage.
   a) 2 b) 4 c) 5 d) 6

4) Only data ADSP-21061 is_____ bit processor.
   a) 8 b) 16 c) 32 d) 64

5) ADSP-21061 is
   a) Harvard architecture b) Advanced Harvard architecture
   c) Super Harvard architecture d) Both b) and c)

6) To use a fixed point DSP device efficiently, one must consider representing filter coefficients and signal samples using
   a) Fixed point2's complement representation
   b) Fixed point1's complement representation
   c) Fixed point2's and 1's complement representation
   d) None

7) The L2 cache of _____ K word is shared by both program and data memory space.
   a) 4 b) 8 c) 16 d) 64

P.T.O.

8) The TMS320C6X fixed point processors execute up to _____, _____ bit per instruction cycle.
a) 8,32 b) 32,8 c) 16,16 d) 16,8

9) The C6X pipeline requires_____phases in decode stage.
a) 2 b) 24 c) 5 d) 6

10) _____ independent buses for dual data fetch, instruction fetch and nonintrusive I/O.
a) 4 b) 8 c) 6 d) 16

11) DSP processors can be used to implement_____application.
a) Image processing b) Video processing
c) Signal processing d) All above

12) In TMS320C6X internal memory is organized as
a) Separate program and data b) Not separate program and data
c) Only program d) Only data

13) 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

14) The result of operation performed in central ALU are stored into
a) ACC b) ACCB c) TREG0 d) PREG

15) SRAM and integrated input output peripherals in ADSP-21061 are
a) Single ported b) Dual ported
c) Single/dual ported d) Both a) and c)

16) The TMS 320C6X generation of DSPs is based on _____architecture.
a) VelociTI b) Velocity c) Velocit d) None

17) The_____ permits execution of logical operation on data without affecting the contents of ACC.
a) Parallel logic unit b) Auxiliary ALU
c) Central ALU d) None

18) The 320c54 DSP are said to have advanced harvard architecture because
a) They have separate memory bus structure for data and program
b) They have instruction the enable data transfer between the program and data
c) They have same memory bus structure for data and program
d) The contents of program memory cannot copy into data memory or vice versa

19) The No. of 32 bit general purpose registers in C6X is
a) 4 b) 8 c) 16 d) 32

20) The multipliers multiply _____ X _____ numbers.
a) 16,16 b) 17,17 c) 24,24 d) 32,32

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SLR-EP – 476

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** : **(5×4=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** : **(10×2=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** : **(5×4=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** : **(10×2=20)**
   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 P

Set P

SLR-EP – 476

Seat No.	

Set Q

B.E. (Electronics and Telecommunication) (Part – II) Examination, 2016
(Elective – II) DSP PROCESSORS AND APPLICATION (New)

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 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 TMS 320C6X generation of DSPs is based on _____architecture.
a) VelociTI b) Velocity c) Velocit d) None

2) The_____ permits execution of logical operation on data without affecting the contents of ACC.
a) Parallel logic unit b) Auxiliary ALU
c) Central ALU d) None

3) The 320c54 DSP are said to have advanced harvard architecture because
a) They have separate memory bus structure for data and program
b) They have instruction the enable data transfer between the program and data
c) They have same memory bus structure for data and program
d) The contents of program memory cannot copy into data memory or vice versa

4) The No. of 32 bit general purpose registers in C6X is
a) 4 b) 8 c) 16 d) 32

5) The multipliers multiply _____ X _____ numbers.
a) 16,16 b) 17,17 c) 24,24 d) 32,32

6) The TMS320C6X is _____ processor.
a) Floating point b) Fixed point
c) Floating/fixed point d) All above

7) The AR ALU (ARAU) performs_____ arithmetic on_____ numbers.
a) Unsigned, 16 b) Singed, 16 c) Signed, 32 d) Unsigned, 32

8) The C6X pipeline requires_____ phases in fetch stage.
a) 2 b) 4 c) 5 d) 6

P.T.O.

9) Only data ADSP-21061 is_____ bit processor.
a) 8 b) 16 c) 32 d) 64

10) ADSP-21061 is
a) Harvard architecture b) Advanced Harvard architecture
c) Super Harvard architecture d) Both b) and c)

11) To use a fixed point DSP device efficiently, one must consider representing filter coefficients and signal samples using
a) Fixed point2's complement representation
b) Fixed point1's complement representation
c) Fixed point2's and 1's complement representation
d) None

12) The L2 cache of _____ K word is shared by both program and data memory space.
a) 4 b) 8 c) 16 d) 64

13) The TMS320C6X fixed point processors execute up to _____, _____ bit per instruction cycle.
a) 8,32 b) 32,8 c) 16,16 d) 16,8

14) The C6X pipeline requires_____phases in decode stage.
a) 2 b) 24 c) 5 d) 6

15) _____ independent buses for dual data fetch, instruction fetch and nonintrusive I/O.
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16) DSP processors can be used to implement_____application.
a) Image processing b) Video processing
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17) In TMS320C6X internal memory is organized as
a) Separate program and data b) Not separate program and data
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18) 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

19) The result of operation performed in central ALU are stored into
a) ACC b) ACCB c) TREG0 d) PREG

20) SRAM and integrated input output peripherals in ADSP-21061 are
a) Single ported b) Dual ported
c) Single/dual ported d) Both a) and c)

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SLR-EP – 476

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** : **(5×4=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** : **(10×2=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** : **(5×4=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** : **(10×2=20)**
   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

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Set Q

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Seat No.	

Set **R**

B.E. (Electronics and Telecommunication) (Part – II) Examination, 2016
(Elective – II) DSP PROCESSORS AND APPLICATION (New)

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.***
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) DSP processors can be used to implement_____application.
   a) Image processing b) Video processing
   c) Signal processing d) All above

2) In TMS320C6X internal memory is organized as
   a) Separate program and data b) Not separate program and data
   c) Only program d) Only data

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   a) Either direct and indirect addressing mode
   b) Either direct or indirect addressing mode
   c) Indirect addressing
   d) All above

4) The result of operation performed in central ALU are stored into
   a) ACC b) ACCB c) TREG0 d) PREG

5) SRAM and integrated input output peripherals in ADSP-21061 are
   a) Single ported b) Dual ported
   c) Single/dual ported d) Both a) and c)

6) The TMS 320C6X generation of DSPs is based on _____architecture.
   a) VelociTI b) Velocity c) Velocit d) None

7) The_____ permits execution of logical operation on data without affecting the contents of ACC.
   a) Parallel logic unit b) Auxiliary ALU
   c) Central ALU d) None

P.T.O.

8) The 320c54 DSP are said to have advanced harvard architecture because
   a) They have separate memory bus structure for data and program
   b) They have instruction the enable data transfer between the program and data
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10) The multipliers multiply _____ X _____ numbers.
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   a) Floating point b) Fixed point
   c) Floating/fixed point d) All above

12) The AR ALU (ARAU) performs_____ arithmetic on_____ numbers.
   a) Unsigned, 16 b) Singed, 16 c) Signed, 32 d) Unsigned, 32

13) The C6X pipeline requires_____ phases in fetch stage.
   a) 2 b) 4 c) 5 d) 6

14) Only data ADSP-21061 is_____ bit processor.
   a) 8 b) 16 c) 32 d) 64

15) ADSP-21061 is
   a) Harvard architecture b) Advanced Harvard architecture
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16) To use a fixed point DSP device efficiently, one must consider representing filter coefficients and signal samples using
   a) Fixed point2's complement representation
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17) The L2 cache of _____ K word is shared by both program and data memory space.
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_____

SLR-EP – 476

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** : **(5×4=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** : **(10×2=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** : **(5×4=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** : **(10×2=20)**
   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 R

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SLR-EP – 476

Seat No.	

Set S

B.E. (Electronics and Telecommunication) (Part – II) Examination, 2016
(Elective – II) DSP PROCESSORS AND APPLICATION (New)

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.***
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **(20×1=20)**

1) To use a fixed point DSP device efficiently, one must consider representing filter coefficients and signal samples using
   a) Fixed point2's complement representation
   b) Fixed point1's complement representation
   c) Fixed point2's and 1's complement representation
   d) None

2) The L2 cache of _____ K word is shared by both program and data memory space.
   a) 4 b) 8 c) 16 d) 64

3) The TMS320C6X fixed point processors execute up to _____, _____ bit per instruction cycle.
   a) 8,32 b) 32,8 c) 16,16 d) 16,8

4) The C6X pipeline requires_____phases in decode stage.
   a) 2 b) 24 c) 5 d) 6

5) _____ independent buses for dual data fetch, instruction fetch and nonintrusive I/O.
   a) 4 b) 8 c) 6 d) 16

6) DSP processors can be used to implement_____application.
   a) Image processing b) Video processing
   c) Signal processing d) All above

7) In TMS320C6X internal memory is organized as
   a) Separate program and data b) Not separate program and data
   c) Only program d) Only data

P.T.O.

8) 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

9) The result of operation performed in central ALU are stored into
   a) ACC b) ACCB c) TREG0 d) PREG

10) SRAM and integrated input output peripherals in ADSP-21061 are
   a) Single ported b) Dual ported
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11) The TMS 320C6X generation of DSPs is based on _____architecture.
   a) VelociTI b) Velocity c) Velocit d) None

12) The_____ permits execution of logical operation on data without affecting the contents of ACC.
   a) Parallel logic unit b) Auxiliary ALU
   c) Central ALU d) None

13) The 320c54 DSP are said to have advanced harvard architecture because
   a) They have separate memory bus structure for data and program
   b) They have instruction the enable data transfer between the program and data
   c) They have same memory bus structure for data and program
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14) The No. of 32 bit general purpose registers in C6X is
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   a) Floating point b) Fixed point
   c) Floating/fixed point d) All above

17) The AR ALU (ARAU) performs_____ arithmetic on_____ numbers.
   a) Unsigned, 16 b) Singed, 16 c) Signed, 32 d) Unsigned, 32

18) The C6X pipeline requires_____ phases in fetch stage.
   a) 2 b) 4 c) 5 d) 6

19) Only data ADSP-21061 is_____ bit processor.
   a) 8 b) 16 c) 32 d) 64

20) ADSP-21061 is
   a) Harvard architecture b) Advanced Harvard architecture
   c) Super Harvard architecture d) Both b) and c)

_____

SLR-EP – 476

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** : **(5×4=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** : **(10×2=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** : **(5×4=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** : **(10×2=20)**
   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 S

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