SLR-VB – 162

Seat No.	

Set P

S.E. (E & TC) (Part – I) (CGPA) Examination, 2017
ENGINEERING MATHEMATICS – III

Day and Date : Thursday, 4-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

N.B. : *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) Attempt **any three** questions from **each** Section.*
*4) Figures to the **right** indicate **full** marks.*
*5) **Use** of calculator is **allowed**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks :14

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

1) The particular integral of $(D + 2)^2 y = e^{-2x}$ is _____

a) $\frac{e^{-2x}}{2}$ b) $\frac{x^2}{4}e^{-2x}$ c) $-\frac{x^2}{2}e^{-2x}$ d) $\frac{x^2}{2}e^{-2x}$

2) The complete solution of $(D^2 + 1)y = 0$, where $D = \frac{d}{dt}$ is _____

a) $y = (c_1 + c_2 t)e^t$ b) $y = c_1 \cos t + c_2 \sin t$
c) $y = c_1 \cos x + c_2 \sin x$ d) $y = c_1 e^{-t} + c_2 e^t$

3) Which of the following is true ?

a) $L^{-1}\{\phi'(s)\} = t\, L^{-1}\{\phi(s)\}$ b) $L^{-1}\{\phi'(s)\} = \frac{1}{t} L^{-1}\{\phi(s)\}$
c) $L^{-1}\{\phi'(s)\} = -t\ L^{-1}\{\phi(s)\}$ d) $L^{-1}\{\phi'(s)\} = -\frac{1}{t} L^{-1}\{\phi(s)\}$

4) $L^{-1}\left\{\frac{1}{\sqrt{s}}\right\} =$ _____

a) $\frac{1}{\sqrt{\pi t}}$ b) $\sqrt{\frac{\pi}{t}}$ c) $\sqrt{\frac{t}{\pi}}$ d) $\frac{t}{\sqrt{\pi}}$

5) If u(t – a) is displaced unit step function, then L{u(t – a)} is equals to _____

a) e^{-as} b) $\frac{e^{as}}{s}$ c) $\frac{e^{-as}}{s}$ d) e^{as}

P.T.O.

6) $L\left\{\int_0^t \cos t\, dt\right\}$ is equals to _____

a) $\frac{s}{s^2+1}$ b) $\frac{1}{s^2+1}$ c) $\frac{s}{s^2-1}$ d) $\frac{1}{s(s^2+1)}$

7) The solution of partial differential equation $\sqrt{p}+\sqrt{q}=1$ is _____

a) $z = ax + \left(1+\sqrt{a}\right)^2 y + c$ b) $z = ax + \left(1-\sqrt{a}\right) y + c$

c) $z = \left(1-\sqrt{b}\right) x + by + c$ d) $z = ax + \left(1-\sqrt{a}\right)^2 y + c$

8) A vector function $\overline{V}$ is called irrotational if _____

a) $\text{div}\,\overline{V} = 0$ b) $\text{grad}\,\overline{V} = 0$ c) $\text{curl}\,\overline{V} = 0$ d) $\nabla^2\overline{V} = 0$

9) If $\phi = x^3 + y^3 + z^3$, then gradϕ at (1, 1, 1) is _____

a) 3i + j + k b) 3(i + j + k) c) 3(i – j – k) d) 3i + j+ 3k

10) If z{f(k)} = F(z) then $z\{k^r f(k)\}$ = _____

a) $\left(z\frac{d}{dz}\right)^r F(z)$ b) $\left(z\frac{d}{dz}\right)^r f(k)$ c) $\left(-z\frac{d}{dz}\right)^r F(z)$ d) None of these

11) If $U(K) = \begin{cases} 1, & k \geq 0 \\ 0, & K < 0 \end{cases}$ then Z{U(K)}= _____

a) $\frac{z}{z-1}$ b) $\frac{1}{z-1}$ c) $\frac{-1}{z-1}$ d) $\frac{-z}{z-1}$

12) The infinite Fourier sine transform of f(x) is given by

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

c) $\sqrt{\frac{2}{\pi}}\int_0^{\infty} f(x)\sin sx\,dx$ d) $\sqrt{\frac{\pi}{2}}\int_0^{\infty} f(x)\sin sx\,dx$

13) If $F_C(\lambda)$ is the Fourier cosine transform of f(x), then f(x) is given by

a) $\sqrt{\frac{2}{\pi}}\int_{-\infty}^{\infty} F_C(\lambda)\cos\lambda x\,d\lambda$ b) $\frac{1}{\sqrt{2\pi}}\int_0^{\infty} F_C(\lambda)\cos\lambda x\,d\lambda$

c) $\sqrt{\frac{2}{\pi}}\int_0^{\infty} F_C(\lambda)\cos\lambda x\,dx$ d) None of these

14) In half range cosine series for $f(x) = (x-1)^2$, $0 \leq x \leq 1$, the constant term is _____

a) $\frac{1}{3}$ b) $-\frac{1}{3}$ c) 0 d) 1

_____

SLR-VB – 162

Seat No.	

S.E. (E & TC) (Part – I) (CGPA) Examination, 2017
ENGINEERING MATHEMATICS – III

Day and Date : Thursday, 4-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt the following :

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

b) Solve : $(D^2 - 2D + 1)y = e^x(x + \sin 2x)$. **3**

c) Solve : $(D^2 - 1)y = \dfrac{2}{1+e^x}$. **4**

OR

c) The differential equation for electrical charge q of a circuit consists of an inductance L, a condenser of capacitance C, a resistance R with electromotive force of 100 volts is

$$L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{1}{C}q = 100$$

If L = 2 henrys, C = 0.05 farads, R = 4 ohms and initially the charge q and current i are zero, then find the charge q at any time t. **4**

3. Solve **any three** from the following : **9**

a) $p(1 + q) = qz$

b) $yp^2 - x^2q = x^2y$

c) $p^2 + q^2 = z^2(x + y)$

d) $y^4zp + zx^4q = xy^4$.

4. Attempt the following :

a) Find $L\left\{\int_0^t e^{-4t} t \sin(2t)\, dt\right\}$. **3**

b) Find $L\left\{\frac{\sin^2(2t)}{t}\right\}$. **3**

c) Express the following function in terms of unit step function and hence, find the Laplace transform $\begin{matrix} f(t) = t & 0 < t < 2 \\ = t^2 & t > 2 \end{matrix}$. **3**

5. Attempt the following :

a) Find $L^{-1}\left\{\frac{s+10}{(s+4)(s^2+9)}\right\}$. **3**

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

c) Using Laplace transform, solve the following linear differential equation with the given conditions :

$y'' + 9y = 18t$
with $y(0) = 0,\ y'(0) = 0$. **3**

SECTION – II

6. a) Obtain half-range sine series for $f(x) = e^{ax}$ in $(0, \pi)$. **4**

b) Find the Fourier expansion of $f(x) = 2 - \frac{x^2}{2}$ in $0 \le x \le 2$. **5**

OR

b) Find the Fourier expansion of $f(x) = x + x^2$ when $-\pi \le x \le \pi$. **5**

7. Attempt **any three** of the following : **9**

   a) Find the angle between the surface $x^2 + y^2 + z^2 - xy = 1$ and $x^2y + y^2z + z = 1$ at (1, 1, 0).

   b) Show that $\bar{F} = (x^2 + xy^2)\,i + (y^2 + x^2y)j$ is irrotational and find the scalar potential.

   c) Prove that $\nabla\left(\nabla \cdot \frac{\bar{r}}{r}\right) = \frac{-2}{r^3}\,\bar{r}$.

   d) A particle moves on the curve $x = 2t^2$, $y = t^2 - 4t$, $z = 3t - 5$. Find the components of velocity and acceleration at $t = 1$ in the direction of $i - 3j + 2k$.

8. a) Find the inverse z-transform of

$$F(z) = \frac{z^2}{\left[z - \frac{1}{4}\right]\left[z - \frac{1}{5}\right]}, \frac{1}{5} < |z| < \frac{1}{4}.$$ **4**

   b) Find the z-transform and its ROC of $f(k) = \frac{5^k}{k!}, k \geq 0$. **3**

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9. a) Find Fourier cosine transform of $e^{-2x} + 4e^{-3x}$. **3**

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

   c) Find the Fourier sine transform of f(x) if **3**

$$f(x) = \begin{cases} 0 & , \quad 0 < x < a \\ x & , \quad a \leq x \leq b \\ 0 & , \quad x > b \end{cases}.$$

Set P

SLR-VB – 162

Seat No.	

Set **Q**

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1) A vector function $\overline{V}$ is called irrotational if _____

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P.T.O.

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_____

SLR-VB – 162

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SECTION – I

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$$f(x) = \begin{cases} 0 & , \quad 0 < x < a \\ x & , \quad a \leq x \leq b \\ 0 & , \quad x > b \end{cases}.$$

Set Q

SLR-VB – 162

Seat No.	

Set **R**

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ENGINEERING MATHEMATICS – III

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P.T.O.

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

c) Using Laplace transform, solve the following linear differential equation with the given conditions :

$y'' + 9y = 18t$
with $y(0) = 0,\ y'(0) = 0$. **3**

SECTION – II

6. a) Obtain half-range sine series for $f(x) = e^{ax}$ in $(0, \pi)$. **4**

b) Find the Fourier expansion of $f(x) = 2 - \frac{x^2}{2}$ in $0 \le x \le 2$. **5**

OR

b) Find the Fourier expansion of $f(x) = x + x^2$ when $-\pi \le x \le \pi$. **5**

7. Attempt **any three** of the following : **9**

   a) Find the angle between the surface $x^2 + y^2 + z^2 - xy = 1$ and $x^2y + y^2z + z = 1$ at (1, 1, 0).

   b) Show that $\bar{F} = (x^2 + xy^2)\,i + (y^2 + x^2y)j$ is irrotational and find the scalar potential.

   c) Prove that $\nabla\left(\nabla \cdot \frac{\bar{r}}{r}\right) = \frac{-2}{r^3}\,\bar{r}$.

   d) A particle moves on the curve $x = 2t^2$, $y = t^2 - 4t$, $z = 3t - 5$. Find the components of velocity and acceleration at $t = 1$ in the direction of $i - 3j + 2k$.

8. a) Find the inverse z-transform of

$$F(z) = \frac{z^2}{\left[z - \frac{1}{4}\right]\left[z - \frac{1}{5}\right]}, \frac{1}{5} < |z| < \frac{1}{4}.$$ **4**

   b) Find the z-transform and its ROC of $f(k) = \frac{5^k}{k!}, k \geq 0$. **3**

   c) Find z-transform of $k3^k + k5^k$, $k \geq 0$. **3**

9. a) Find Fourier cosine transform of $e^{-2x} + 4e^{-3x}$. **3**

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

   c) Find the Fourier sine transform of f(x) if **3**

$$f(x) = \begin{cases} 0 & , \quad 0 < x < a \\ x & , \quad a \leq x \leq b \\ 0 & , \quad x > b \end{cases}.$$

Set R

SLR-VB – 162

Seat No.	

Set S

S.E. (E & TC) (Part – I) (CGPA) Examination, 2017
ENGINEERING MATHEMATICS – III

Day and Date : Thursday, 4-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

N.B. : *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) Attempt **any three** questions from **each** Section.*
*4) Figures to the **right** indicate **full** marks.*
*5) **Use** of calculator is **allowed**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks :14

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

1) If $z\{f(k)\} = F(z)$ then $z\{k^r f(k)\} =$ _____

a) $\left(z\frac{d}{dz}\right)^r F(z)$ b) $\left(z\frac{d}{dz}\right)^r f(k)$ c) $\left(-z\frac{d}{dz}\right)^r F(z)$ d) None of these

2) If $U(K) = \begin{cases} 1, & k \geq 0 \\ 0, & K < 0 \end{cases}$ then $Z\{U(K)\}=$ _____

a) $\frac{z}{z-1}$ b) $\frac{1}{z-1}$ c) $\frac{-1}{z-1}$ d) $\frac{-z}{z-1}$

3) The infinite Fourier sine transform of f(x) is given by

a) $\sqrt{\frac{2}{\pi}}\int_{-\infty}^{\infty} f(x)\sin sx dx$ b) $\int_0^{\infty} f(x)\cos sx dx$

c) $\sqrt{\frac{2}{\pi}}\int_0^{\infty} f(x)\sin sx dx$ d) $\sqrt{\frac{\pi}{2}}\int_0^{\infty} f(x)\sin sx dx$

4) If $F_C(\lambda)$ is the Fourier cosine transform of f(x), then f(x) is given by

a) $\sqrt{\frac{2}{\pi}}\int_{-\infty}^{\infty} F_C(\lambda)\cos\lambda x\, d\lambda$ b) $\frac{1}{\sqrt{2\pi}}\int_0^{\infty} F_C(\lambda)\cos\lambda x\, d\lambda$

c) $\sqrt{\frac{2}{\pi}}\int_0^{\infty} F_C(\lambda)\cos\lambda x\, dx$ d) None of these

5) In half range cosine series for $f(x) = (x-1)^2$, $0 \leq x \leq 1$, the constant term is _____

a) $\frac{1}{3}$ b) $-\frac{1}{3}$ c) 0 d) 1

P.T.O.

6) The particular integral of $(D + 2)^2 y = e^{-2x}$ is _____

a) $\frac{e^{-2x}}{2}$ b) $\frac{x^2}{4}e^{-2x}$ c) $-\frac{x^2}{2}e^{-2x}$ d) $\frac{x^2}{2}e^{-2x}$

7) The complete solution of $(D^2 + 1)y = 0$, where $D = \frac{d}{dt}$ is _____

a) $y = (c_1 + c_2 t)e^t$ b) $y = c_1 \cos t + c_2 \sin t$

c) $y = c_1 \cos x + c_2 \sin x$ d) $y = c_1 e^{-t} + c_2 e^t$

8) Which of the following is true ?

a) $L^{-1}\{\phi'(s)\} = t\, L^{-1}\{\phi(s)\}$ b) $L^{-1}\{\phi'(s)\} = \frac{1}{t} L^{-1}\{\phi(s)\}$

c) $L^{-1}\{\phi'(s)\} = -t\ L^{-1}\{\phi(s)\}$ d) $L^{-1}\{\phi'(s)\} = -\frac{1}{t} L^{-1}\{\phi(s)\}$

9) $L^{-1}\left\{\frac{1}{\sqrt{s}}\right\} =$ _____

a) $\frac{1}{\sqrt{\pi t}}$ b) $\sqrt{\frac{\pi}{t}}$ c) $\sqrt{\frac{t}{\pi}}$ d) $\frac{t}{\sqrt{\pi}}$

10) If u(t – a) is displaced unit step function, then L{u(t – a)} is equals to _____

a) e^{-as} b) $\frac{e^{as}}{s}$ c) $\frac{e^{-as}}{s}$ d) e^{as}

11) $L\left\{\int_0^t \cos t\, dt\right\}$ is equals to _____

a) $\frac{s}{s^2 + 1}$ b) $\frac{1}{s^2 + 1}$ c) $\frac{s}{s^2 - 1}$ d) $\frac{1}{s(s^2 + 1)}$

12) The solution of partial differential equation $\sqrt{p} + \sqrt{q} = 1$ is _____

a) $z = ax + \left(1 + \sqrt{a}\right)^2 y + c$ b) $z = ax + \left(1 - \sqrt{a}\right) y + c$

c) $z = \left(1 - \sqrt{b}\right) x + by + c$ d) $z = ax + \left(1 - \sqrt{a}\right)^2 y + c$

13) A vector function $\overline{V}$ is called irrotational if _____

a) $\text{div}\,\overline{V} = 0$ b) $\text{grad}\,\overline{V} = 0$ c) $\text{curl}\,\overline{V} = 0$ d) $\nabla^2 \overline{V} = 0$

14) If $\phi = x^3 + y^3 + z^3$, then $\text{grad}\,\phi$ at (1, 1, 1) is _____

a) 3i + j + k b) 3(i + j + k) c) 3(i – j – k) d) 3i + j+ 3k

SLR-VB – 162

Seat No.	

S.E. (E & TC) (Part – I) (CGPA) Examination, 2017
ENGINEERING MATHEMATICS – III

Day and Date : Thursday, 4-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt the following :

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

b) Solve : $(D^2 - 2D + 1)y = e^x(x + \sin 2x)$. **3**

c) Solve : $(D^2 - 1)y = \frac{2}{1+e^x}$. **4**

OR

c) The differential equation for electrical charge q of a circuit consists of an inductance L, a condenser of capacitance C, a resistance R with electromotive force of 100 volts is

$$L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{1}{C}q = 100$$

If L = 2 henrys, C = 0.05 farads, R = 4 ohms and initially the charge q and current i are zero, then find the charge q at any time t. **4**

3. Solve **any three** from the following : **9**

a) $p(1 + q) = qz$

b) $yp^2 - x^2q = x^2y$

c) $p^2 + q^2 = z^2(x + y)$

d) $y^4zp + zx^4q = xy^4$.

4. Attempt the following :

a) Find $L\left\{\int_0^t e^{-4t} t \sin(2t)\, dt\right\}$. **3**

b) Find $L\left\{\frac{\sin^2(2t)}{t}\right\}$. **3**

c) Express the following function in terms of unit step function and hence, find the Laplace transform $\begin{matrix} f(t) = t & 0 < t < 2 \\ = t^2 & t > 2 \end{matrix}$. **3**

5. Attempt the following :

a) Find $L^{-1}\left\{\frac{s+10}{(s+4)(s^2+9)}\right\}$. **3**

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

c) Using Laplace transform, solve the following linear differential equation with the given conditions :

$y'' + 9y = 18t$
with $y(0) = 0,\ y'(0) = 0$. **3**

SECTION – II

6. a) Obtain half-range sine series for $f(x) = e^{ax}$ in $(0, \pi)$. **4**

b) Find the Fourier expansion of $f(x) = 2 - \frac{x^2}{2}$ in $0 \le x \le 2$. **5**

OR

b) Find the Fourier expansion of $f(x) = x + x^2$ when $-\pi \le x \le \pi$. **5**

7. Attempt **any three** of the following : **9**

   a) Find the angle between the surface $x^2 + y^2 + z^2 - xy = 1$ and $x^2y + y^2z + z = 1$ at (1, 1, 0).

   b) Show that $\bar{F} = (x^2 + xy^2)\,i + (y^2 + x^2y)j$ is irrotational and find the scalar potential.

   c) Prove that $\nabla\left(\nabla \cdot \frac{\bar{r}}{r}\right) = \frac{-2}{r^3}\,\bar{r}$.

   d) A particle moves on the curve $x = 2t^2$, $y = t^2 - 4t$, $z = 3t - 5$. Find the components of velocity and acceleration at $t = 1$ in the direction of $i - 3j + 2k$.

8. a) Find the inverse z-transform of

$$F(z) = \frac{z^2}{\left[z - \frac{1}{4}\right]\left[z - \frac{1}{5}\right]}, \frac{1}{5} < |z| < \frac{1}{4}.$$ **4**

   b) Find the z-transform and its ROC of $f(k) = \frac{5^k}{k!}, k \geq 0$. **3**

   c) Find z-transform of $k3^k + k5^k$, $k \geq 0$. **3**

9. a) Find Fourier cosine transform of $e^{-2x} + 4e^{-3x}$. **3**

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

   c) Find the Fourier sine transform of f(x) if **3**

$$f(x) = \begin{cases} 0 & , \quad 0 < x < a \\ x & , \quad a \leq x \leq b \\ 0 & , \quad x > b \end{cases}.$$

Set S

SLR-VB – 163

Seat No.	

Set P

S.E. (Part – I) (E and TC) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

Day and Date : Friday, 5-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Select the appropriate option : **(1×14=14)**

1) A capacitors are connected in _____ load diode in Clamper circuits.
   a) Parallel b) Series c) Shunt d) None of these

2) Ripple factor is _____ proportional to RL for inductor filter and its _____ proportional to RL for capacitor filter respectively.
   a) Directly, directly b) Directly, inversely
   c) Inversely, directly d) Inversely, inversely

3) Zener diode in breakdown region is used as
   a) Delay circuit b) Frequency divider by 2 circuit
   c) Current regulator d) Voltage regulator

4) Assuming diodes be ideal, its forward DC resistance will be
   a) 5 KΩ b) 20 KΩ c) 10 KΩ d) None of above

5) For fixed load and variable input voltage in zener regulators, Vi (min) is limited by
   a) Iz(min) b) Vz c) Iz(max) d) None

6) In clamper circuits capacitors are working as
   a) Voltage bias b) Current bias c) Isolators d) Impedance

7) The load and line regulation of ideal power supply must be
   a) Zero b) Infinite c) Large d) None

P.T.O.

8) The region in which Vds > Vp and Vgs > Vp for n channel JFET is called as
   a) Pichoff region b) Ohmic region
   c) Cutoff region d) None of these

9) Output of RC coupled single stage CE amplifier is _____ of input signal.
   a) Out of phase b) In phase
   c) 90° lead of phase d) None of these

10) The region in which JFET works as variable resistance is called as
   a) Pichoff region b) Ohmic region
   c) Cutoff region d) None of these

11) Doping concentration of npn transistor are
   1) 4×10^{18} cm^{-3}
   2) 10^{17} cm^{-3}
   3) 3×10^{17} cm^{-3} then the region in order 123 are
   a) BCE b) CBE c) EBC d) None of above

12) Generally gain of transistor amplifier fall at high frequency due to
   a) Coupling capacitor b) Emitter by pass capacitor
   c) Both a) and b) d) Junction capacitance

13) For faithful amplification without distortion 'Q' point must be selected
   a) Near saturation
   b) Near cutoff
   c) At middle of the active
   d) Middle of the active region and below P.D. curve

14) Power dissipation curve is function of _____ in CE transistor amplifier.
   a) Vcb, Ib b) Vce, Ib c) Vce, Ic d) None

_____

SLR-VB – 163

Seat No.	

S.E. (Part – I) (E and TC) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

Day and Date : Friday, 5-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Solve **any four** : **(3.5×4=14)**
   1) Explain different types of clamper circuits without biasing with transfer characteristics.
   2) Explain the operation of voltage tripler. Give its application.
   3) The reverse saturation current of silicon diode is 0.5 uA. Calculate diode current for forward bias voltage of 0.5 V at 25°C.
   4) Derive the expression for ripple factor for L filter for full wave rectifier.
   5) Explain effect of temperature on diode characteristics for PN junction.

3. Solve **any two** : **(7×2=14)**
   a) Design unregulated DC power supply using full wave bridge rectifier and capacitor filter for following specification :
   Output D.C. voltage = 10V, Ripple factor = 8%, load current = 100 mA.
   b) Explain Zener as regulator. Derive expression for zener diode regulator with fixed input voltage and variable load resistor.
   c) Explain with neat diagram operation of half wave rectifier. Derive expression for following parameters Vorms, Voavg, ripple factor, efficiency, TUF and PIV.

SECTION – II

4. Solve **any four** : **(3.5×4=14)**
   a) Explain thermal stability and derive expression for stability factor for voltage divider bias.
   b) Explain different biasing techniques for BJT amplifier.
   c) Explain MOSFET as switch and list its applications in short.
   d) Explain thermal runaway in BJT amplifier.
   e) Explain effect of input and output coupling capacitors on frequency response of BJT amplifier.

5. Solve **any two** : **(7×2=14)**

   a) What are different types of JFET ? Explain drain current equation and explain any one with transfer and output characteristics.

   b) Derive expression for voltage gain, current gain, input impedance, output impedance for CE with fixed bias, emitter resistance and emitter bypass capacitor using H parameter.

   c) Design single stage voltage CE amplifier with voltage divider bias for voltage gain of 5, stability factor of 10 and operating point at (6V, 2 mA) and frequency range of 20 Hz to 19 KHz. Assume load resistance is too higher than Rc.

   For given npn transistor : PD max = 250m W, hfe = 250, hie = 2K Ω, 1/hoe = 1 Mega Ω.

SLR-VB – 163

Seat No.	

Set Q

S.E. (Part – I) (E and TC) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

Day and Date : Friday, 5-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Select the appropriate option : **(1×14=14)**

1) The region in which Vds > Vp and Vgs > Vp for n channel JFET is called as
   a) Pichoff region b) Ohmic region
   c) Cutoff region d) None of these

2) Output of RC coupled single stage CE amplifier is _____ of input signal.
   a) Out of phase b) In phase
   c) 90° lead of phase d) None of these

3) The region in which JFET works as variable resistance is called as
   a) Pichoff region b) Ohmic region
   c) Cutoff region d) None of these

4) Doping concentration of npn transistor are
   1) 4×10^{18} cm^{-3}
   2) 10^{17} cm^{-3}
   3) 3×10^{17} cm^{-3} then the region in order 123 are
   a) BCE b) CBE c) EBC d) None of above

5) Generally gain of transistor amplifier fall at high frequency due to
   a) Coupling capacitor b) Emitter by pass capacitor
   c) Both a) and b) d) Junction capacitance

P.T.O.

6) For faithful amplification without distortion 'Q' point must be selected
   a) Near saturation
   b) Near cutoff
   c) At middle of the active
   d) Middle of the active region and below P.D. curve

7) Power dissipation curve is function of _____ in CE transistor amplifier.
   a) Vcb, Ib b) Vce, Ib c) Vce, Ic d) None

8) A capacitors are connected in _____ load diode in Clamper circuits.
   a) Parallel b) Series c) Shunt d) None of these

9) Ripple factor is _____ proportional to RL for inductor filter and its _____ proportional to RL for capacitor filter respectively.
   a) Directly, directly b) Directly, inversely
   c) Inversely, directly d) Inversely, inversely

10) Zener diode in breakdown region is used as
   a) Delay circuit b) Frequency divider by 2 circuit
   c) Current regulator d) Voltage regulator

11) Assuming diodes be ideal, its forward DC resistance will be
   a) 5 KΩ b) 20 KΩ c) 10 KΩ d) None of above

12) For fixed load and variable input voltage in zener regulators, Vi (min) is limited by
   a) Iz(min) b) Vz c) Iz(max) d) None

13) In clamper circuits capacitors are working as
   a) Voltage bias b) Current bias c) Isolators d) Impedance

14) The load and line regulation of ideal power supply must be
   a) Zero b) Infinite c) Large d) None

_____

SLR-VB – 163

Seat No.	

S.E. (Part – I) (E and TC) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

Day and Date : Friday, 5-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Solve **any four** : **(3.5×4=14)**
   1) Explain different types of clamper circuits without biasing with transfer characteristics.
   2) Explain the operation of voltage tripler. Give its application.
   3) The reverse saturation current of silicon diode is 0.5 uA. Calculate diode current for forward bias voltage of 0.5 V at 25°C.
   4) Derive the expression for ripple factor for L filter for full wave rectifier.
   5) Explain effect of temperature on diode characteristics for PN junction.

3. Solve **any two** : **(7×2=14)**
   a) Design unregulated DC power supply using full wave bridge rectifier and capacitor filter for following specification :
   Output D.C. voltage = 10V, Ripple factor = 8%, load current = 100 mA.
   b) Explain Zener as regulator. Derive expression for zener diode regulator with fixed input voltage and variable load resistor.
   c) Explain with neat diagram operation of half wave rectifier. Derive expression for following parameters Vorms, Voavg, ripple factor, efficiency, TUF and PIV.

SECTION – II

4. Solve **any four** : **(3.5×4=14)**
   a) Explain thermal stability and derive expression for stability factor for voltage divider bias.
   b) Explain different biasing techniques for BJT amplifier.
   c) Explain MOSFET as switch and list its applications in short.
   d) Explain thermal runaway in BJT amplifier.
   e) Explain effect of input and output coupling capacitors on frequency response of BJT amplifier.

5. Solve **any two** : **(7×2=14)**

   a) What are different types of JFET ? Explain drain current equation and explain any one with transfer and output characteristics.

   b) Derive expression for voltage gain, current gain, input impedance, output impedance for CE with fixed bias, emitter resistance and emitter bypass capacitor using H parameter.

   c) Design single stage voltage CE amplifier with voltage divider bias for voltage gain of 5, stability factor of 10 and operating point at (6V, 2 mA) and frequency range of 20 Hz to 19 KHz. Assume load resistance is too higher than Rc.

   For given npn transistor : PD max = 250m W, hfe = 250, hie = 2K Ω, 1/hoe = 1 Mega Ω.

SLR-VB – 163

Seat No.	

Set R

S.E. (Part – I) (E and TC) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

Day and Date : Friday, 5-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Select the appropriate option : **(1×14=14)**

1) For fixed load and variable input voltage in zener regulators, Vi (min) is limited by
   a) Iz(min) b) Vz c) Iz(max) d) None

2) In clamper circuits capacitors are working as
   a) Voltage bias b) Current bias
   c) Isolators d) Impedance

3) The load and line regulation of ideal power supply must be
   a) Zero b) Infinite c) Large d) None

4) The region in which Vds > Vp and Vgs > Vp for n channel JFET is called as
   a) Pichoff region b) Ohmic region
   c) Cutoff region d) None of these

5) Output of RC coupled single stage CE amplifier is _____ of input signal.
   a) Out of phase b) In phase
   c) 90° lead of phase d) None of these

6) The region in which JFET works as variable resistance is called as
   a) Pichoff region b) Ohmic region
   c) Cutoff region d) None of these

7) Doping concentration of npn transistor are
   1) 4×10^{18} cm^{-3}
   2) 10^{17} cm^{-3}
   3) 3×10^{17} cm^{-3} then the region in order 123 are
   a) BCE b) CBE c) EBC d) None of above

8) Generally gain of transistor amplifier fall at high frequency due to
   a) Coupling capacitor b) Emitter by pass capacitor
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9) For faithful amplification without distortion 'Q' point must be selected
   a) Near saturation
   b) Near cutoff
   c) At middle of the active
   d) Middle of the active region and below P.D. curve

10) Power dissipation curve is function of _____ in CE transistor amplifier.
   a) Vcb, Ib b) Vce, Ib c) Vce, Ic d) None

11) A capacitors are connected in _____ load diode in Clamper circuits.
   a) Parallel b) Series c) Shunt d) None of these

12) Ripple factor is _____ proportional to RL for inductor filter and its _____ proportional to RL for capacitor filter respectively.
   a) Directly, directly b) Directly, inversely
   c) Inversely, directly d) Inversely, inversely

13) Zener diode in breakdown region is used as
   a) Delay circuit b) Frequency divider by 2 circuit
   c) Current regulator d) Voltage regulator

14) Assuming diodes be ideal, its forward DC resistance will be
   a) 5 KΩ b) 20 KΩ c) 10 KΩ d) None of above

_____

SLR-VB – 163

Seat No.	

S.E. (Part – I) (E and TC) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

Day and Date : Friday, 5-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Solve **any four** : **(3.5×4=14)**
   1) Explain different types of clamper circuits without biasing with transfer characteristics.
   2) Explain the operation of voltage tripler. Give its application.
   3) The reverse saturation current of silicon diode is 0.5 uA. Calculate diode current for forward bias voltage of 0.5 V at 25°C.
   4) Derive the expression for ripple factor for L filter for full wave rectifier.
   5) Explain effect of temperature on diode characteristics for PN junction.

3. Solve **any two** : **(7×2=14)**
   a) Design unregulated DC power supply using full wave bridge rectifier and capacitor filter for following specification :
   Output D.C. voltage = 10V, Ripple factor = 8%, load current = 100 mA.
   b) Explain Zener as regulator. Derive expression for zener diode regulator with fixed input voltage and variable load resistor.
   c) Explain with neat diagram operation of half wave rectifier. Derive expression for following parameters Vorms, Voavg, ripple factor, efficiency, TUF and PIV.

SECTION – II

4. Solve **any four** : **(3.5×4=14)**
   a) Explain thermal stability and derive expression for stability factor for voltage divider bias.
   b) Explain different biasing techniques for BJT amplifier.
   c) Explain MOSFET as switch and list its applications in short.
   d) Explain thermal runaway in BJT amplifier.
   e) Explain effect of input and output coupling capacitors on frequency response of BJT amplifier.

5. Solve **any two** : **(7×2=14)**

   a) What are different types of JFET ? Explain drain current equation and explain any one with transfer and output characteristics.

   b) Derive expression for voltage gain, current gain, input impedance, output impedance for CE with fixed bias, emitter resistance and emitter bypass capacitor using H parameter.

   c) Design single stage voltage CE amplifier with voltage divider bias for voltage gain of 5, stability factor of 10 and operating point at (6V, 2 mA) and frequency range of 20 Hz to 19 KHz. Assume load resistance is too higher than Rc.

   For given npn transistor : PD max = 250m W, hfe = 250, hie = 2KΩ, 1/hoe = 1 MegaΩ.

SLR-VB – 163

Seat No.	

Set S

S.E. (Part – I) (E and TC) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

Day and Date : Friday, 5-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Select the appropriate option : **(1×14=14)**

1) The region in which JFET works as variable resistance is called as
   a) Pichoff region b) Ohmic region
   c) Cutoff region d) None of these

2) Doping concentration of npn transistor are
   1) 4×10^{18} cm^{-3}
   2) 10^{17} cm^{-3}
   3) 3×10^{17} cm^{-3} then the region in order 123 are
   a) BCE b) CBE c) EBC d) None of above

3) Generally gain of transistor amplifier fall at high frequency due to
   a) Coupling capacitor b) Emitter by pass capacitor
   c) Both a) and b) d) Junction capacitance

4) For faithful amplification without distortion 'Q' point must be selected
   a) Near saturation
   b) Near cutoff
   c) At middle of the active
   d) Middle of the active region and below P.D. curve

5) Power dissipation curve is function of _____ in CE transistor amplifier.
   a) Vcb, Ib b) Vce, Ib c) Vce, Ic d) None

P.T.O.

6) A capacitors are connected in _____ load diode in Clamper circuits.
   a) Parallel b) Series c) Shunt d) None of these

7) Ripple factor is _____ proportional to RL for inductor filter and its _____ proportional to RL for capacitor filter respectively.
   a) Directly, directly b) Directly, inversely
   c) Inversely, directly d) Inversely, inversely

8) Zener diode in breakdown region is used as
   a) Delay circuit b) Frequency divider by 2 circuit
   c) Current regulator d) Voltage regulator

9) Assuming diodes be ideal, its forward DC resistance will be
   a) 5 KΩ b) 20 KΩ c) 10 KΩ d) None of above

10) For fixed load and variable input voltage in zener regulators, Vi (min) is limited by
   a) Iz(min) b) Vz c) Iz(max) d) None

11) In clamper circuits capacitors are working as
   a) Voltage bias b) Current bias c) Isolators d) Impedance

12) The load and line regulation of ideal power supply must be
   a) Zero b) Infinite c) Large d) None

13) The region in which Vds > Vp and Vgs > Vp for n channel JFET is called as
   a) Pichoff region b) Ohmic region
   c) Cutoff region d) None of these

14) Output of RC coupled single stage CE amplifier is _____ of input signal.
   a) Out of phase b) In phase
   c) 90° lead of phase d) None of these

_____

SLR-VB – 163

Seat No.	

S.E. (Part – I) (E and TC) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

Day and Date : Friday, 5-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Solve **any four** : **(3.5×4=14)**
   1) Explain different types of clamper circuits without biasing with transfer characteristics.
   2) Explain the operation of voltage tripler. Give its application.
   3) The reverse saturation current of silicon diode is 0.5 uA. Calculate diode current for forward bias voltage of 0.5 V at 25°C.
   4) Derive the expression for ripple factor for L filter for full wave rectifier.
   5) Explain effect of temperature on diode characteristics for PN junction.

3. Solve **any two** : **(7×2=14)**
   a) Design unregulated DC power supply using full wave bridge rectifier and capacitor filter for following specification :
   Output D.C. voltage = 10V, Ripple factor = 8%, load current = 100 mA.
   b) Explain Zener as regulator. Derive expression for zener diode regulator with fixed input voltage and variable load resistor.
   c) Explain with neat diagram operation of half wave rectifier. Derive expression for following parameters Vorms, Voavg, ripple factor, efficiency, TUF and PIV.

SECTION – II

4. Solve **any four** : **(3.5×4=14)**
   a) Explain thermal stability and derive expression for stability factor for voltage divider bias.
   b) Explain different biasing techniques for BJT amplifier.
   c) Explain MOSFET as switch and list its applications in short.
   d) Explain thermal runaway in BJT amplifier.
   e) Explain effect of input and output coupling capacitors on frequency response of BJT amplifier.

5. Solve **any two** : **(7×2=14)**

   a) What are different types of JFET ? Explain drain current equation and explain any one with transfer and output characteristics.

   b) Derive expression for voltage gain, current gain, input impedance, output impedance for CE with fixed bias, emitter resistance and emitter bypass capacitor using H parameter.

   c) Design single stage voltage CE amplifier with voltage divider bias for voltage gain of 5, stability factor of 10 and operating point at (6V, 2 mA) and frequency range of 20 Hz to 19 KHz. Assume load resistance is too higher than Rc.

   For given npn transistor : PD max = 250m W, hfe = 250, hie = 2K Ω, 1/hoe = 1 Mega Ω.

SLR-VB – 164

Seat No.	

Set P

S.E. (E&TC) (Part – I) Examination, 2017
(CGPA Pattern)
CIRCUITS AND NETWORKS

Day and Date : Saturday, 6-5-2017 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****.*

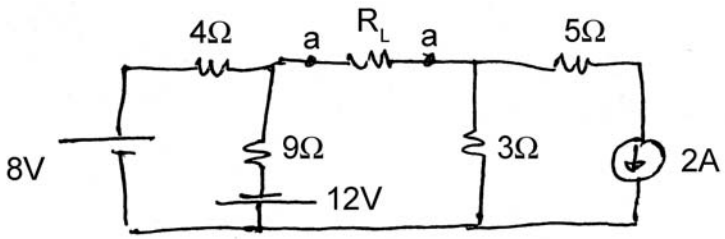
MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

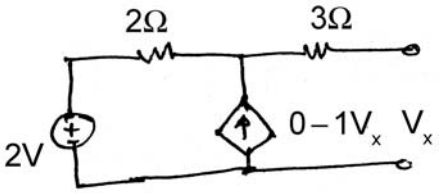
1) A practical source consist of
   a) An ideal current source in series with resistance
   b) An ideal current source parallel with resistors
   c) Both a and b
   d) None of the above

2) The value of R between "ab" to have maximum power transfer is



a) 4.63 Ω b) 5.76 Ω c) 2.76 Ω d) 6 Ω

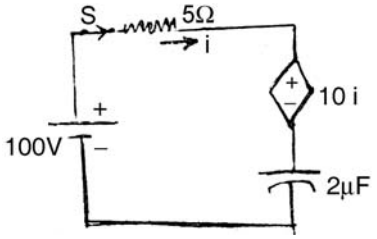
3) Thevenin's voltage in the circuit shown in figure is



a) 0.1 b) 2V c) 2.5 d) 3V

P.T.O.

4) Parallel resonance is also called as
   a) Acceptor circuit b) Rejecter circuit c) Both a and b d) None of the above
5) The Q factor in parallel resonant circuit is given by
   a) WrL/R b) R/WrL c) WrC d) Both b and c
6) The number of possible combinations of 4 variables taking 2 at a time in a two part network is
   a) 4 b) 2 c) 8 d) 6
7) h21, in terms of z parameters can be expressed as
   a) $\Delta Z / Z_{22}$ b) $\Delta Z / Z_{12}$ c) $Z_{12} / \Delta Z$ d) $-Z_{21} / Z_{22}$
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 and b
   d) None of the above
9) 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) $\frac{V}{L}$
10) 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
11) In the M-derived low pass filter the resonant frequency is to be chosen 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
12) 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) $\text{Cosh}(Y) = 1 + Z_1/Z_2$
13) The necessity condition for transfer function is
   a) the coefficients in P(s) and Q(s) must be real
   b) the coefficients in Q(s) may be negative
   c) complex or imaginary pole and zeros may not conjugate
   d) if the real part of pole is zero, then that pole must be multiple
14) The initial current in the circuit shown, when switch is opened for t > 0 is



   a) 1.5 A b) 0 A c) 2 A d) 10 A

SLR-VB – 164

Seat No.	

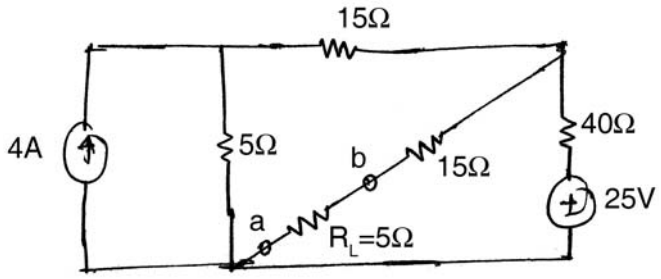
S.E. (E&TC) (Part – I) Examination, 2017
(CGPA Pattern)
CIRCUITS AND NETWORKS

Day and Date : Saturday, 6-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

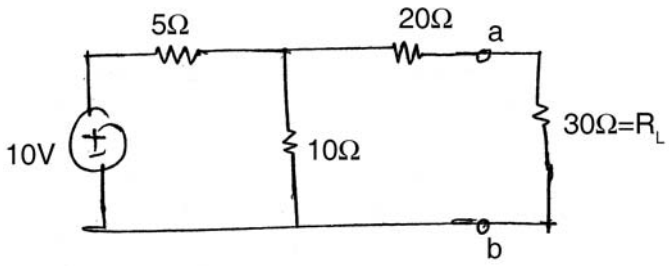
SECTION – I

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

1) Using superposition theorem, find the current through RL in the circuit shown

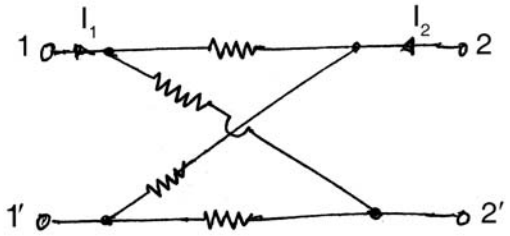


2) Find the Norton's equivalent circuit for the network shown between points 1 & 2 and hence find the current flowing through load RL.



3) Derive the expression for maximum voltage across the capacitor in series RLC circuit.

4) Find the z parameters of the lattice network shown below

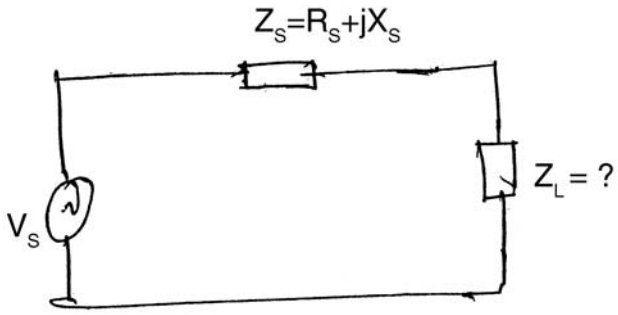


5) Draw and explain the cascade connection of the two port network.

Set P

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

1) State the maximum power Theorem for the AC circuit and hence derive the expression for ZL for which it receives the maximum power. What is the maximum power delivered to the load ?



2) Define the selectivity. What is the effect of resistance on frequency response and selectivity ? An impedance of Z1 = 10 + j10Ω is connected in parallel with another impedance of resistance 8.5Ω and a variable capacitance in series. Find C such that the circuit is in resonance at 5KHz.

3) Determine the Y parameters and hence determine the ABCD parameters for the pi network shown below. Is this network bilateral or not ?

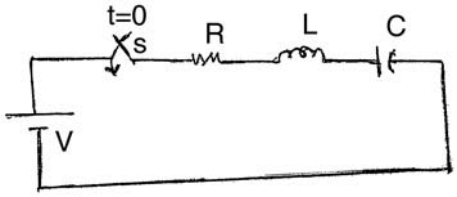
SECTION – II

4. Solve **any four**. **(4×4=16)**

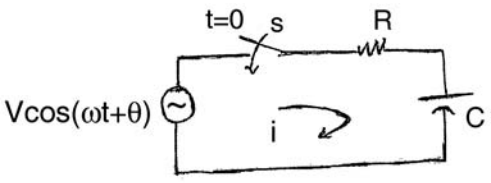
1) Draw the pole zero diagram for the given network function and obtain the time domain response.

$$I(s) = \frac{3s}{(s+1)(s+3)}$$

2) Derive expression for i(t), for the circuit given if R = 5Ω, L = 1H, C = 1F and V=20V applied at t = 0.



3) Derive the expression for the resultant current for the circuit shown

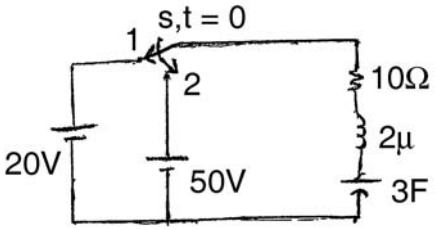


4) Design a band eliminate filter having a impedance of 500 Ω and cut-off frequency F_1 = 1KHz & F_2 = 5 KHz and also draw attenuation plot for band stop filter.

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

5. Solve **any two**. **(2×6=12)**

1) In the network shown, the switch S is moved from position 1 to position 2 at t = 0. The switch S is in position 1 for long time. Determine expression for the current i(t).



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

3) Prove that for band pass filter $f_0 = \sqrt{f_1 * f_2}$. Design a band pass filter having design impedance of 600 Ω and cut off frequency f_1 = 2 KHz and f_2 = 8 KHz.

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Set P

SLR-VB – 164

Seat No.	

Set Q

S.E. (E&TC) (Part – I) Examination, 2017
(CGPA Pattern)
CIRCUITS AND NETWORKS

Day and Date : Saturday, 6-5-2017 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****.*

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 and b
   d) None of the above

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

3) The transient current in loss free LC circuit when excited from AC source is an _____ sine wave.
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4) In the M-derived low pass filter the resonant frequency is to be chosen so that it is
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5) 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) $\text{Cosh}(Y) = 1 + Z_1/Z_2$

6) The necessity condition for transfer function is
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   b) the coefficients in Q(s) may be negative
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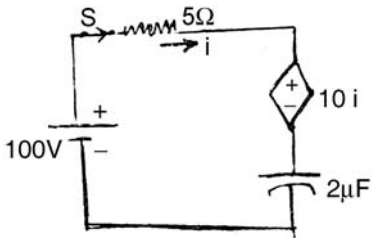
P.T.O.

7) The initial current in the circuit shown, when switch is opened for t > 0 is



a) 1.5 A b) 0 A c) 2 A d) 10 A

8) A practical source consist of
   a) An ideal current source in series with resistance
   b) An ideal current source parallel with resistors
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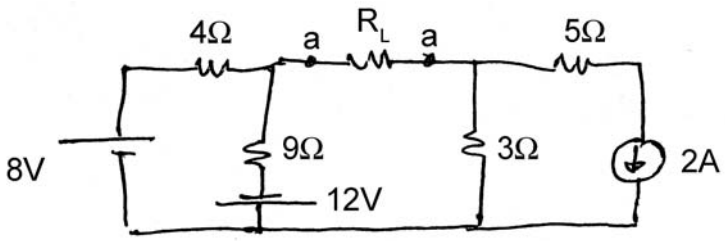
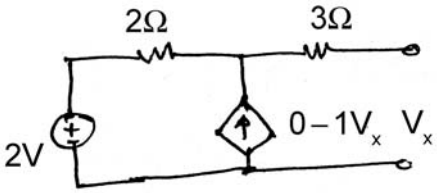
9) The value of R between "ab" to have maximum power transfer is



a) 4.63Ω b) 5.76Ω c) 2.76Ω d) 6Ω

10) Thevenin's voltage in the circuit shown in figure is



a) 0.1 b) 2V c) 2.5 d) 3V

11) Parallel resonance is also called as
   a) Acceptor circuit b) Rejecter circuit c) Both a and b d) None of the above

12) The Q factor in parallel resonant circuit is given by
   a) WrL/R b) R/WrL c) WrC d) Both b and c

13) The number of possible combinations of 4 variables taking 2 at a time in a two part network is
   a) 4 b) 2 c) 8 d) 6

14) h21, in terms of z parameters can be expressed as
   a) $\Delta Z / Z_{22}$ b) $\Delta Z / Z_{12}$ c) $Z_{12} / \Delta Z$ d) $-Z_{21} / Z_{22}$

SLR-VB – 164

Seat No.	

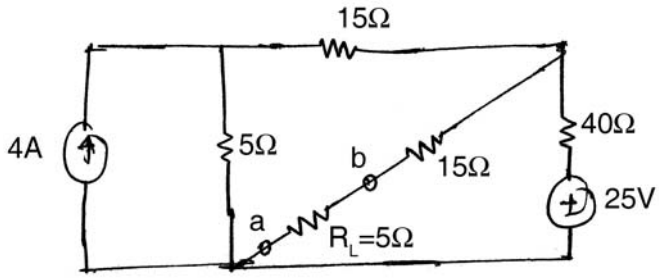
S.E. (E&TC) (Part – I) Examination, 2017
(CGPA Pattern)
CIRCUITS AND NETWORKS

Day and Date : Saturday, 6-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

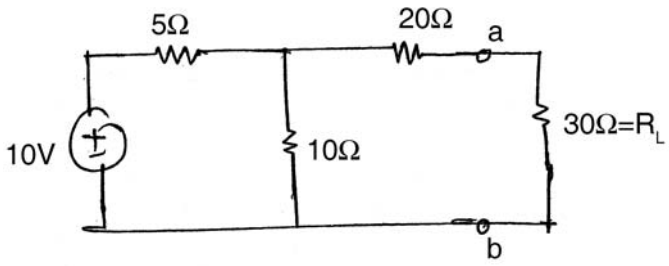
SECTION – I

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

1) Using superposition theorem, find the current through RL in the circuit shown

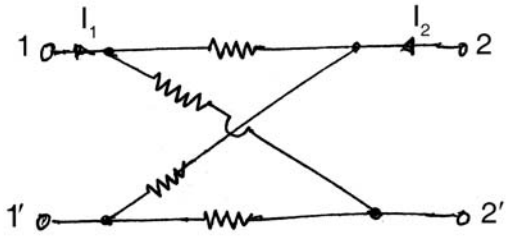


2) Find the Norton's equivalent circuit for the network shown between points 1 & 2 and hence find the current flowing through load RL.



3) Derive the expression for maximum voltage across the capacitor in series RLC circuit.

4) Find the z parameters of the lattice network shown below

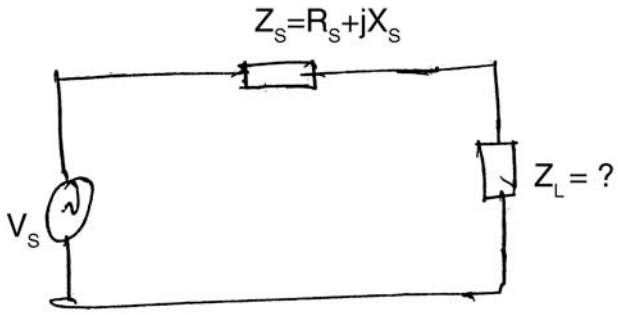


5) Draw and explain the cascade connection of the two port network.

Set Q

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

1) State the maximum power Theorem for the AC circuit and hence derive the expression for ZL for which it receives the maximum power. What is the maximum power delivered to the load ?



2) Define the selectivity. What is the effect of resistance on frequency response and selectivity ? An impedance of Z1 = 10 + j10Ω is connected in parallel with another impedance of resistance 8.5Ω and a variable capacitance in series. Find C such that the circuit is in resonance at 5KHz.

3) Determine the Y parameters and hence determine the ABCD parameters for the pi network shown below. Is this network bilateral or not ?

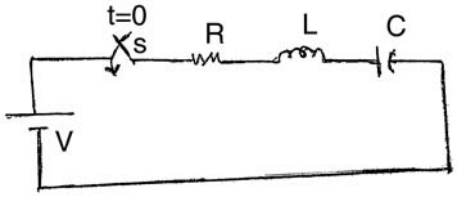
SECTION – II

4. Solve **any four**. **(4×4=16)**

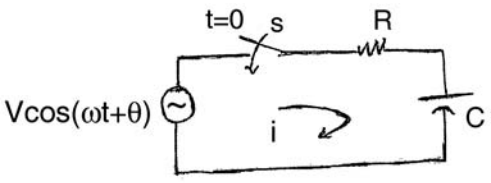
1) Draw the pole zero diagram for the given network function and obtain the time domain response.

$$I(s) = \frac{3s}{(s+1)(s+3)}$$

2) Derive expression for i(t), for the circuit given if R = 5Ω, L = 1H, C = 1F and V=20V applied at t = 0.



3) Derive the expression for the resultant current for the circuit shown

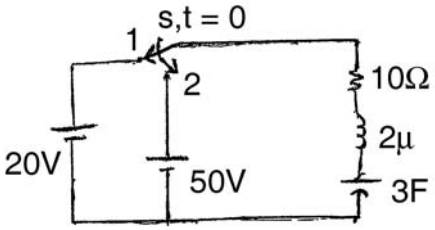


4) Design a band eliminate filter having a impedance of 500 Ω and cut-off frequency F_1 = 1KHz & F_2 = 5 KHz and also draw attenuation plot for band stop filter.

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

5. Solve **any two**. **(2×6=12)**

1) In the network shown, the switch S is moved from position 1 to position 2 at t = 0. The switch S is in position 1 for long time. Determine expression for the current i(t).



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

3) Prove that for band pass filter $f_0 = \sqrt{f_1 * f_2}$. Design a band pass filter having design impedance of 600 Ω and cut off frequency f_1 = 2 KHz and f_2 = 8 KHz.

———————————

Set Q

SLR-VB – 164

Seat No.	

Set R

S.E. (E&TC) (Part – I) Examination, 2017
(CGPA Pattern)
CIRCUITS AND NETWORKS

Day and Date : Saturday, 6-5-2017 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****.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The Q factor in parallel resonant circuit is given by
a) WrL/R b) R/WrL c) WrC d) Both b and c

2) The number of possible combinations of 4 variables taking 2 at a time in a two part network is
a) 4 b) 2 c) 8 d) 6

3) h21, in terms of z parameters can be expressed as
a) $\Delta Z / Z_{22}$ b) $\Delta Z / Z_{12}$ c) $Z_{12} / \Delta Z$ d) $-Z_{21} / Z_{22}$

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 and b
d) None of the above

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

6) 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

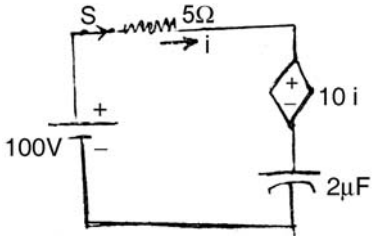
7) In the M-derived low pass filter the resonant frequency is to be chosen so that it is
a) Above cut-off frequency b) Below cut-off frequency
c) Equal to cut-off frequency d) None of the above

P.T.O.

8) 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) $\text{Cosh}(Y) = 1 + Z_1/Z_2$

9) The necessity condition for transfer function is
   a) the coefficients in P(s) and Q(s) must be real
   b) the coefficients in Q(s) may be negative
   c) complex or imaginary pole and zeros may not conjugate
   d) if the real part of pole is zero, then that pole must be multiple

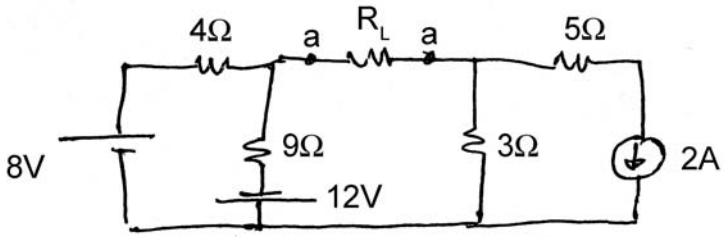
10) The initial current in the circuit shown, when switch is opened for t > 0 is



a) 1.5 A b) 0 A c) 2 A d) 10 A

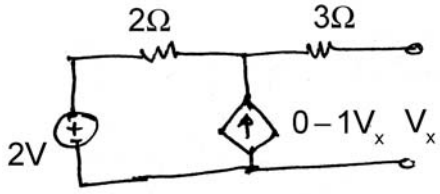
11) A practical source consist of
   a) An ideal current source in series with resistance
   b) An ideal current source parallel with resistors
   c) Both a and b
   d) None of the above

12) The value of R between “ab” to have maximum power transfer is



a) 4.63Ω b) 5.76Ω c) 2.76Ω d) 6Ω

13) Thevenin’s voltage in the circuit shown in figure is



a) 0.1 b) 2V c) 2.5 d) 3V

14) Parallel resonance is also called as
   a) Acceptor circuit b) Rejecter circuit c) Both a and b d) None of the above

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SLR-VB – 164

Seat No.	

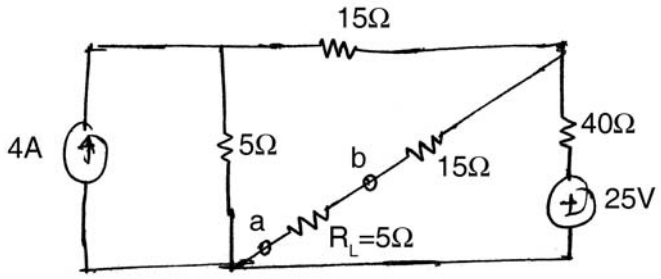
S.E. (E&TC) (Part – I) Examination, 2017
(CGPA Pattern)
CIRCUITS AND NETWORKS

Day and Date : Saturday, 6-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

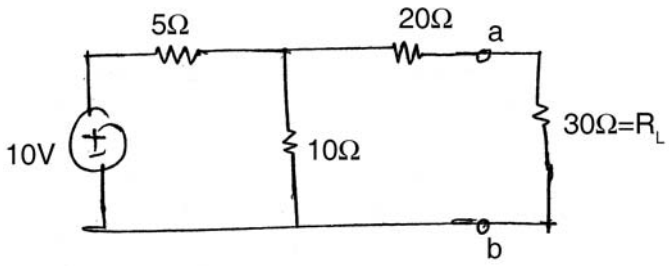
SECTION – I

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

1) Using superposition theorem, find the current through RL in the circuit shown

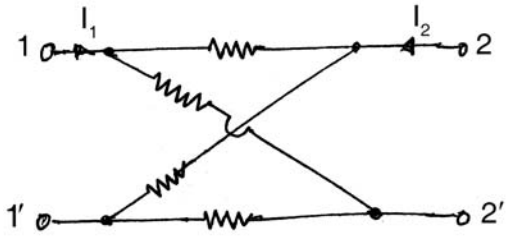


2) Find the Norton's equivalent circuit for the network shown between points 1 & 2 and hence find the current flowing through load RL.



3) Derive the expression for maximum voltage across the capacitor in series RLC circuit.

4) Find the z parameters of the lattice network shown below

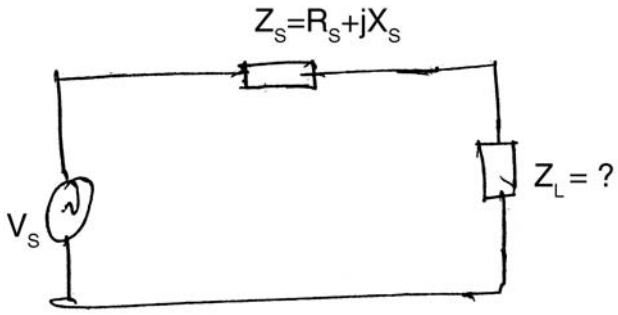


5) Draw and explain the cascade connection of the two port network.

Set R

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

1) State the maximum power Theorem for the AC circuit and hence derive the expression for ZL for which it receives the maximum power. What is the maximum power delivered to the load ?



2) Define the selectivity. What is the effect of resistance on frequency response and selectivity ? An impedance of Z1 = 10 + j10Ω is connected in parallel with another impedance of resistance 8.5Ω and a variable capacitance in series. Find C such that the circuit is in resonance at 5KHz.

3) Determine the Y parameters and hence determine the ABCD parameters for the pi network shown below. Is this network bilateral or not ?

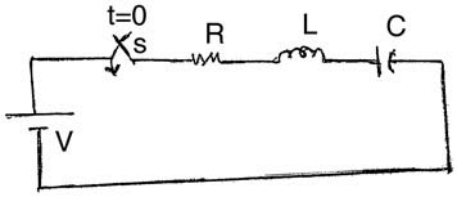
SECTION – II

4. Solve **any four**. **(4×4=16)**

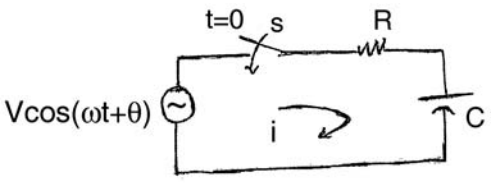
1) Draw the pole zero diagram for the given network function and obtain the time domain response.

$$I(s) = \frac{3s}{(s+1)(s+3)}$$

2) Derive expression for i(t), for the circuit given if R = 5Ω, L = 1H, C = 1F and V=20V applied at t = 0.



3) Derive the expression for the resultant current for the circuit shown

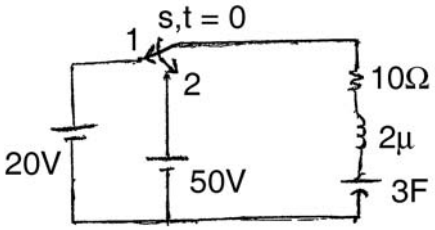


4) Design a band eliminate filter having a impedance of $500\,\Omega$ and cut-off frequency F_1 = 1KHz & F_2 = 5 KHz and also draw attenuation plot for band stop filter.

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

5. Solve **any two**. **(2×6=12)**

1) In the network shown, the switch S is moved from position 1 to position 2 at t = 0. The switch S is in position 1 for long time. Determine expression for the current i(t).



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

3) Prove that for band pass filter $f_0 = \sqrt{f_1 * f_2}$. Design a band pass filter having design impedance of $600\,\Omega$ and cut off frequency f_1 = 2 KHz and f_2 = 8 KHz.

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Set R

SLR-VB – 164

Seat No.	

Set S

S.E. (E&TC) (Part – I) Examination, 2017
(CGPA Pattern)
CIRCUITS AND NETWORKS

Day and Date : Saturday, 6-5-2017 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****.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) 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

2) In the M-derived low pass filter the resonant frequency is to be chosen 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

3) 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) $\text{Cosh}(Y) = 1 + Z_1/Z_2$

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   b) the coefficients in Q(s) may be negative
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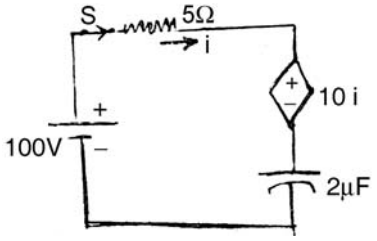
5) The initial current in the circuit shown, when switch is opened for t > 0 is



   a) 1.5 A b) 0 A c) 2 A d) 10 A

P.T.O.

6) A practical source consist of
   a) An ideal current source in series with resistance
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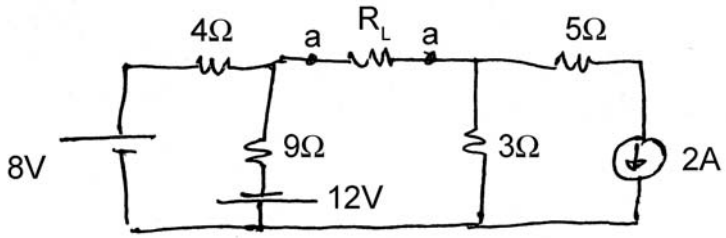
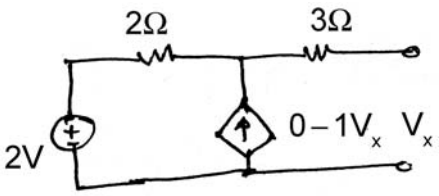
   c) Both a and b
   d) None of the above

7) The value of R between "ab" to have maximum power transfer is



a) 4.63Ω b) 5.76Ω c) 2.76Ω d) 6Ω

8) Thevenin's voltage in the circuit shown in figure is



a) 0.1 b) 2V c) 2.5 d) 3V

9) Parallel resonance is also called as
   a) Acceptor circuit b) Rejecter circuit c) Both a and b d) None of the above

10) The Q factor in parallel resonant circuit is given by
   a) WrL/R b) R/WrL c) WrC d) Both b and c

11) The number of possible combinations of 4 variables taking 2 at a time in a two part network is
   a) 4 b) 2 c) 8 d) 6

12) h21, in terms of z parameters can be expressed as
   a) $\Delta Z / Z_{22}$ b) $\Delta Z / Z_{12}$ c) $Z_{12} / \Delta Z$ d) $-Z_{21} / Z_{22}$

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 and b
   d) None of the above

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

SLR-VB – 164

Seat No.	

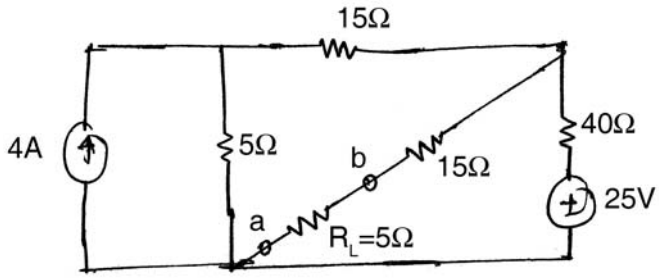
S.E. (E&TC) (Part – I) Examination, 2017
(CGPA Pattern)
CIRCUITS AND NETWORKS

Day and Date : Saturday, 6-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

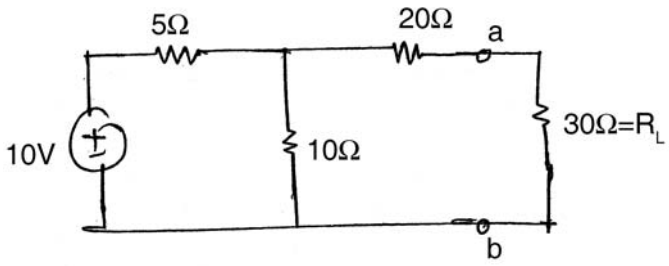
SECTION – I

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

1) Using superposition theorem, find the current through RL in the circuit shown

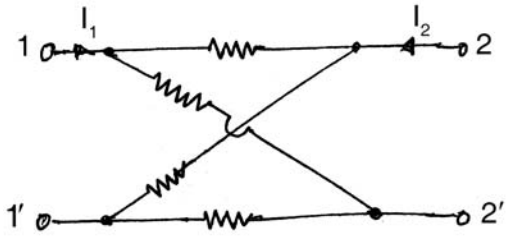


2) Find the Norton's equivalent circuit for the network shown between points 1 & 2 and hence find the current flowing through load RL.



3) Derive the expression for maximum voltage across the capacitor in series RLC circuit.

4) Find the z parameters of the lattice network shown below

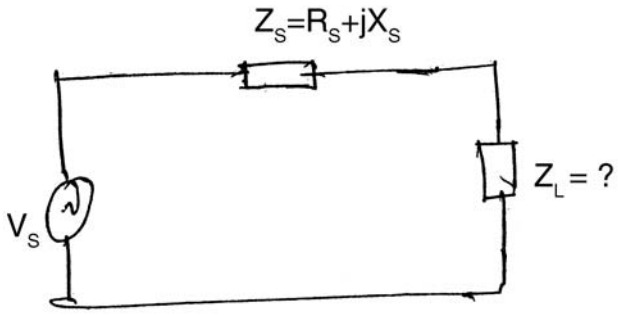


5) Draw and explain the cascade connection of the two port network.

Set S

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

1) State the maximum power Theorem for the AC circuit and hence derive the expression for ZL for which it receives the maximum power. What is the maximum power delivered to the load ?



2) Define the selectivity. What is the effect of resistance on frequency response and selectivity ? An impedance of Z1 = 10 + j10Ω is connected in parallel with another impedance of resistance 8.5Ω and a variable capacitance in series. Find C such that the circuit is in resonance at 5KHz.

3) Determine the Y parameters and hence determine the ABCD parameters for the pi network shown below. Is this network bilateral or not ?

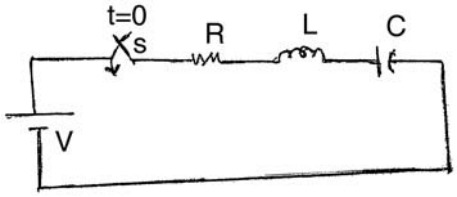
SECTION – II

4. Solve **any four**. **(4×4=16)**

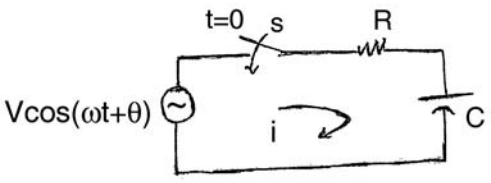
1) Draw the pole zero diagram for the given network function and obtain the time domain response.

$$I(s) = \frac{3s}{(s+1)(s+3)}$$

2) Derive expression for i(t), for the circuit given if R = 5Ω, L = 1H, C = 1F and V=20V applied at t = 0.



3) Derive the expression for the resultant current for the circuit shown

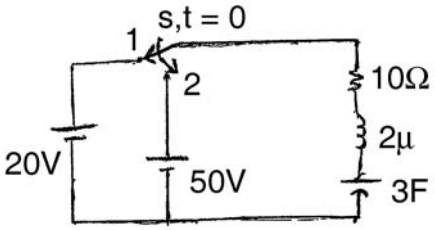


4) Design a band eliminate filter having a impedance of $500\,\Omega$ and cut-off frequency F_1 = 1KHz & F_2 = 5 KHz and also draw attenuation plot for band stop filter.

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

5. Solve **any two**. **(2×6=12)**

1) In the network shown, the switch S is moved from position 1 to position 2 at t = 0. The switch S is in position 1 for long time. Determine expression for the current i(t).



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

3) Prove that for band pass filter $f_0 = \sqrt{f_1 * f_2}$. Design a band pass filter having design impedance of $600\,\Omega$ and cut off frequency f_1 = 2 KHz and f_2 = 8 KHz.

———————————

Set S

SLR-VB – 165

Seat No.	

Set **P**

S.E. (Part – I) (Electronics and Telecommunication Engineering) (CGPA) Examination, 2017
DIGITAL TECHNIQUES

Day and Date : Monday, 8-5-2017 Total Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Figures to **right** indicate **full** marks.*
*3) **Assume** suitable data **whenever** 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) In a 4 variable K-map, the function contains all minterms then the minimal expression is _____
A) A B) 1 C) 0 D) Don't care

2) IC 7483 work as _____
A) Comparator B) Adder C) Decoder D) Shift Register

3) Gray Code is _____
A) None Weighted code B) Cyclic code
C) Reflected code D) All the above

4) While converting the SR flip flop in to D flip flop, the SR inputs are _____
A) S = D, $R = \overline{D}$ B) $S = \overline{D}, R = D$ C) $S = R = D$ D) $S = R = \overline{D}$

5) Looping a pair of 2 adjacent is in a K-map eliminates _____ number of variables.
A) 1 B) 2 C) n D) n-1

6) The dynamic hazard problem occurs in _____
   A) Combinational circuit only
   B) Sequential circuits only
   C) Both Sequential and Combinational circuit
   D) None of above

7) The given minterm is A.B.C, its Maxterm equivalent binary representation is
   A) 101 B) 110 C) 111 D) 000

8) The Memory which is programmed at the time of its manufacturing is
   A) ROM B) RAM C) PROM D) EPROM

9) A mod-12 and a mod-10 counter are cascaded. Determine the output frequency if the input clock frequency is 60 MHz.
   A) 500 kHz B) 1500 kHz C) 6 MHz D) 5 MHz

10) The next state of D flip flop is
   A) Compliment of input B) Independent of input
   C) Same as input D) None

11) What is shift register that will accept a parallel input, or bidirectional serial load and internal shift features, called ?
   A) Tri-state B) Universal C) End around D) Conversion

12) A Mealy system produces a 1 output if input has been consecutively one three times. The number of flip flops required are
   A) 4 B) 3 C) 2 D) 1

13) The Maximum possible number of states in a clocked sequential circuit having 6 flip flop are
   A) 64 B) 16 C) 8 D) 32

14) A PLA can be used
   A) To realize a sequential logic B) To realize a combinational logic
   C) As a memory D) None of these

_____

SLR-VB – 165

Seat No.	

S.E. (Part – I) (Electronics and Telecommunication Engineering) (CGPA) Examination, 2017
DIGITAL TECHNIQUES

Day and Date : Monday, 8-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Solve **any four** : **14**
   1) Implement CMOS3-input NAND and NOR gate.
   2) Explain flip-flop as 1 bit latch.
   3) Explain Static hazards.
   4) Explain IC 74181 in short.
   5) Write a short note on Gray Code.

3. Solve **any two** : **14**
   1) Explain the characteristics of TTL logic family with typical values.
   2) Explain clocked SR flip-flop with preset and clear. Also give the excitation table and characteristics equation.
   3) Implement the following function using single 4 : 1 multiplexer
      $F(PQRS) = \Sigma m(0, 1, 3, 4, 7, 10, 12, 14)$.

SECTION – II

4. Solve **any four** : **14**
   1) Write note on Mealy machine.
   2) Design MOD 6 ripple counter.
   3) Draw and explain Bidirectional shift register.
   4) Draw and explain 4 bit up/down counter.
   5) Explain sequence generator in detail.

5. Attempt **any two** : **14**

   1) Implement the combinational logic functions by using 3×4×2 PLA.
      F_1 (A, B, C) = Σm (3, 5, 6, 7), F_2 (A, B, C) = Σm (0, 2, 4, 7).
   2) Explain universal shift register using IC7495.
   3) Explain the state diagram, state assignment, state reduction and implementation using flip-flop by suitable example.

SLR-VB – 165

Seat No.	

Set Q

S.E. (Part – I) (Electronics and Telecommunication Engineering) (CGPA) Examination, 2017
DIGITAL TECHNIQUES

Day and Date : Monday, 8-5-2017 Total Marks : 70
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 : 14

1. Choose the correct answer : **14**

1) The Memory which is programmed at the time of its manufacturing is
A) ROM B) RAM C) PROM D) EPROM

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C) Both Sequential and Combinational circuit
D) None of above

14) The given minterm is A.B.C, its Maxterm equivalent binary representation is
A) 101 B) 110 C) 111 D) 000

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SLR-VB – 165

Seat No.	

S.E. (Part – I) (Electronics and Telecommunication Engineering) (CGPA) Examination, 2017
DIGITAL TECHNIQUES

Day and Date : Monday, 8-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Solve **any four** : **14**
   1) Implement CMOS3-input NAND and NOR gate.
   2) Explain flip-flop as 1 bit latch.
   3) Explain Static hazards.
   4) Explain IC 74181 in short.
   5) Write a short note on Gray Code.

3. Solve **any two** : **14**
   1) Explain the characteristics of TTL logic family with typical values.
   2) Explain clocked SR flip-flop with preset and clear. Also give the excitation table and characteristics equation.
   3) Implement the following function using single 4 : 1 multiplexer
      $F(PQRS) = \Sigma m(0, 1, 3, 4, 7, 10, 12, 14)$.

SECTION – II

4. Solve **any four** : **14**
   1) Write note on Mealy machine.
   2) Design MOD 6 ripple counter.
   3) Draw and explain Bidirectional shift register.
   4) Draw and explain 4 bit up/down counter.
   5) Explain sequence generator in detail.

5. Attempt **any two** : **14**

   1) Implement the combinational logic functions by using 3×4×2 PLA.
      F_1 (A, B, C) = Σm (3, 5, 6, 7), F_2 (A, B, C) = Σm (0, 2, 4, 7).
   2) Explain universal shift register using IC7495.
   3) Explain the state diagram, state assignment, state reduction and implementation using flip-flop by suitable example.

SLR-VB – 165

Seat No.	

Set **R**

S.E. (Part – I) (Electronics and Telecommunication Engineering) (CGPA) Examination, 2017
DIGITAL TECHNIQUES

Day and Date : Monday, 8-5-2017 Total Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to ***right*** *indicate* ***full*** *marks.*
3) ***Assume*** *suitable data* ***whenever*** *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) Looping a pair of 2 adjacent is in a K-map eliminates _____ number of variables.
A) 1 B) 2 C) n D) n-1

2) The dynamic hazard problem occurs in _____
A) Combinational circuit only
B) Sequential circuits only
C) Both Sequential and Combinational circuit
D) None of above

3) The given minterm is A.B.C, its Maxterm equivalent binary representation is
A) 101 B) 110 C) 111 D) 000

4) The Memory which is programmed at the time of its manufacturing is
A) ROM B) RAM C) PROM D) EPROM

5) A mod-12 and a mod-10 counter are cascaded. Determine the output frequency if the input clock frequency is 60 MHz.
A) 500 kHz B) 1500 kHz C) 6 MHz D) 5 MHz

6) The next state of D flip flop is
   A) Compliment of input B) Independent of input
   C) Same as input D) None

7) What is shift register that will accept a parallel input, or bidirectional serial load and internal shift features, called ?
   A) Tri-state B) Universal C) End around D) Conversion

8) A Mealy system produces a 1 output if input has been consecutively one three times. The number of flip flops required are
   A) 4 B) 3 C) 2 D) 1

9) The Maximum possible number of states in a clocked sequential circuit having 6 flip flop are
   A) 64 B) 16 C) 8 D) 32

10) A PLA can be used
   A) To realize a sequential logic B) To realize a combinational logic
   C) As a memory D) None of these

11) In a 4 variable K-map, the function contains all minterms then the minimal expression is _____
   A) A B) 1 C) 0 D) Don't care

12) IC 7483 work as _____
   A) Comparator B) Adder C) Decoder D) Shift Register

13) Gray Code is _____
   A) None Weighted code B) Cyclic code
   C) Reflected code D) All the above

14) While converting the SR flip flop in to D flip flop, the SR inputs are _____
   A) $S = D, R = \overline{D}$ B) $S = \overline{D}, R = D$ C) $S = R = D$ D) $S = R = \overline{D}$

_____

SLR-VB – 165

Seat No.	

S.E. (Part – I) (Electronics and Telecommunication Engineering) (CGPA) Examination, 2017
DIGITAL TECHNIQUES

Day and Date : Monday, 8-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Solve **any four** : **14**
   1) Implement CMOS3-input NAND and NOR gate.
   2) Explain flip-flop as 1 bit latch.
   3) Explain Static hazards.
   4) Explain IC 74181 in short.
   5) Write a short note on Gray Code.

3. Solve **any two** : **14**
   1) Explain the characteristics of TTL logic family with typical values.
   2) Explain clocked SR flip-flop with preset and clear. Also give the excitation table and characteristics equation.
   3) Implement the following function using single 4 : 1 multiplexer
      $F(PQRS) = \Sigma m(0, 1, 3, 4, 7, 10, 12, 14)$.

SECTION – II

4. Solve **any four** : **14**
   1) Write note on Mealy machine.
   2) Design MOD 6 ripple counter.
   3) Draw and explain Bidirectional shift register.
   4) Draw and explain 4 bit up/down counter.
   5) Explain sequence generator in detail.

5. Attempt **any two** : **14**

   1) Implement the combinational logic functions by using 3×4×2 PLA.
      F_1 (A, B, C) = Σm (3, 5, 6, 7), F_2 (A, B, C) = Σm (0, 2, 4, 7).
   2) Explain universal shift register using IC7495.
   3) Explain the state diagram, state assignment, state reduction and implementation using flip-flop by suitable example.

SLR-VB – 165

Seat No.	

Set S

S.E. (Part – I) (Electronics and Telecommunication Engineering) (CGPA) Examination, 2017
DIGITAL TECHNIQUES

Day and Date : Monday, 8-5-2017 Total Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to ***right*** *indicate* ***full*** *marks.*
3) ***Assume*** *suitable data* ***whenever*** *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) The next state of D flip flop is
   A) Compliment of input B) Independent of input
   C) Same as input D) None

2) What is shift register that will accept a parallel input, or bidirectional serial load and internal shift features, called ?
   A) Tri-state B) Universal C) End around D) Conversion

3) A Mealy system produces a 1 output if input has been consecutively one three times. The number of flip flops required are
   A) 4 B) 3 C) 2 D) 1

4) The Maximum possible number of states in a clocked sequential circuit having 6 flip flop are
   A) 64 B) 16 C) 8 D) 32

5) A PLA can be used
   A) To realize a sequential logic B) To realize a combinational logic
   C) As a memory D) None of these

P.T.O.

6) In a 4 variable K-map, the function contains all minterms then the minimal expression is _____
   A) A B) 1 C) 0 D) Don't care

7) IC 7483 work as _____
   A) Comparator B) Adder C) Decoder D) Shift Register

8) Gray Code is _____
   A) None Weighted code B) Cyclic code
   C) Reflected code D) All the above

9) While converting the SR flip flop in to D flip flop, the SR inputs are _____
   A) $S = D, R = \overline{D}$ B) $S = \overline{D}, R = D$ C) $S = R = D$ D) $S = R = \overline{D}$

10) Looping a pair of 2 adjacent is in a K-map eliminates _____ number of variables.
   A) 1 B) 2 C) n D) n-1

11) The dynamic hazard problem occurs in _____
   A) Combinational circuit only
   B) Sequential circuits only
   C) Both Sequential and Combinational circuit
   D) None of above

12) The given minterm is A.B.C, its Maxterm equivalent binary representation is
   A) 101 B) 110 C) 111 D) 000

13) The Memory which is programmed at the time of its manufacturing is
   A) ROM B) RAM C) PROM D) EPROM

14) A mod-12 and a mod-10 counter are cascaded. Determine the output frequency if the input clock frequency is 60 MHz.
   A) 500 kHz B) 1500 kHz C) 6 MHz D) 5 MHz

_____

SLR-VB – 165

Seat No.	

S.E. (Part – I) (Electronics and Telecommunication Engineering) (CGPA) Examination, 2017
DIGITAL TECHNIQUES

Day and Date : Monday, 8-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Solve **any four** : **14**
   1) Implement CMOS3-input NAND and NOR gate.
   2) Explain flip-flop as 1 bit latch.
   3) Explain Static hazards.
   4) Explain IC 74181 in short.
   5) Write a short note on Gray Code.

3. Solve **any two** : **14**
   1) Explain the characteristics of TTL logic family with typical values.
   2) Explain clocked SR flip-flop with preset and clear. Also give the excitation table and characteristics equation.
   3) Implement the following function using single 4 : 1 multiplexer
      $F(PQRS) = \Sigma m(0, 1, 3, 4, 7, 10, 12, 14)$.

SECTION – II

4. Solve **any four** : **14**
   1) Write note on Mealy machine.
   2) Design MOD 6 ripple counter.
   3) Draw and explain Bidirectional shift register.
   4) Draw and explain 4 bit up/down counter.
   5) Explain sequence generator in detail.

5. Attempt **any two** : **14**

   1) Implement the combinational logic functions by using 3×4×2 PLA.
   F_1 (A, B, C) = Σm (3, 5, 6, 7), F_2 (A, B, C) = Σm (0, 2, 4, 7).

   2) Explain universal shift register using IC7495.

   3) Explain the state diagram, state assignment, state reduction and implementation using flip-flop by suitable example.

SLR-VB – 166

Seat No.	

Set **P**

S.E. (E and TC) (Part – I) (CGPA Pattern) Examination, 2017
DATA STRUCTURES USING 'C'

Day and Date : Tuesday, 9-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Node of doubly linked list contains following fields
   a) info, next b) info, next, back
   c) front, rear d) none of the above

2) Overflow condition of queue is
   a) rear = = max – 1 b) top = = max – 1
   c) front = = max – 1 d) both a), b)

3) Stack is useful in implementing
   a) Heap b) Breadth first search
   c) Recursion d) Radix

4) When we delete an element in queue, which pointer is incremented ?
   a) Front b) Rear
   c) Both front and rear d) None of the above

5) In _____ notation the operator follows the two operands.
   a) Prefix b) Postfix
   c) Infix d) Polish

6) The result of evaluating the following postfix expression is
   5, 7, 9, *, +, 4, 9, 3, /, +, –
   a) 50 b) 65 c) 61 d) 69

7) Factorial (0) is
   a) 0 b) 1 c) infinity d) undefined

P.T.O.

8) If h is any hashing function and is used to hash n keys into a table of size m, where n<=m, the expected number of collisions involving a particular key x is
   a) less than 1 b) less than n c) less than m d) less than n/2

9) The worst case occur in linear search algorithm when
   a) Item is somewhere in the middle of the array
   b) Item is not in the array at all
   c) Item is the last element in the array
   d) Item is the last element in the array or item is not there at all

10) Which of the following algorithm design technique is used in the quick sort algorithm ?
   a) Dynamic programming b) Backtracking
   c) Divide-and-conquer d) Greedy method

11) The sort which inserts each elements A(K) into proper position in the previously sorted sub array A(1), . . ., A(K –1).
   a) Insertion sort b) Radix sort c) Merge sort d) Bubble sort

12) A BST is traversed in the following order recursively : Right, root, left

   The output sequence will be in
   a) Ascending order b) Descending order
   c) Bitomic sequence d) No specific order

13) The minimum number of edges required to create a cyclic graph of n vertices is
   a) n b) n – 1 c) n + 1 d) 2n

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) 10 20 15 30 40 35 25
   c) 10 15 20 25 30 35 40 d) 40 35 30 25 20 15 10

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SLR-VB – 166

Seat No.	

S.E. (E and TC) (Part – I) (CGPA Pattern) Examination, 2017
DATA STRUCTURES USING 'C'

Day and Date : Tuesday, 9-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four** questions : **(4×3=12)**
   1) Evaluate the given postfix expression : 4 2 ^ 3 * 3 – 8 4 / 11 + / +.
   2) Define recursive function and draw the recursive flow chart.
   3) Explain the representation of a polynomial using linked list.
   4) Define the function to check overflow and underflow condition of stack.
   5) Write a note on double ended queue.

3. Attempt **any one** question : **8**
   1) How to convert infix expression to postfix expression. Convert the following infix expression into postfix expression. (A + B)*C/D.
   2) WAP to implement queue using array.

4. Attempt the question : **8**

   Write a program to implement following operation on singly linked list
   a) Creation of list
   b) Insertion of element at beginning
   c) Deletion of element at end
   d) Display.

SECTION – II

5. Attempt **any four** questions : **(4×3=12)**
   1) How to represent a graph using adjacency matrix and linked list.
   2) Explain Merge sort. Sort the following sequence in ascending order using Top Down Merge sort.

      8, 5, 89, 30, 42, 92, 64, 4, 21, 56, 3
   3) Write a program to implement a selection sort method.
   4) Define Hashing. Explain following hash function with example.
      a) Folding method
      b) Division method.
   5) Describe Radix Sort. Sort the given data 24, 32, 47, 11, 56, 45 using Radix Sort.

6. Solve **any one** question : **8**
   1) Explain graph traversal methods with examples.
   2) Define Binary Search Tree. Create a binary search tree with the help of following information.

      Preorder : 67, 34, 12, 10, 45, 38, 60, 80, 78, 95, 86

      Inorder : 10, 12, 34, 38, 45, 60, 67, 78, 80, 86, 95

      Show the binary search tree after deleting the node 34 and 80.

7. 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. **8**

SLR-VB – 166

Seat No.	

Set **Q**

S.E. (E and TC) (Part – I) (CGPA Pattern) Examination, 2017
DATA STRUCTURES USING 'C'

Day and Date : Tuesday, 9-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) If h is any hashing function and is used to hash n keys into a table of size m, where n<=m, the expected number of collisions involving a particular key x is
   a) less than 1 b) less than n c) less than m d) less than n/2

2) The worst case occur in linear search algorithm when
   a) Item is somewhere in the middle of the array
   b) Item is not in the array at all
   c) Item is the last element in the array
   d) Item is the last element in the array or item is not there at all

3) Which of the following algorithm design technique is used in the quick sort algorithm ?
   a) Dynamic programming b) Backtracking
   c) Divide-and-conquer d) Greedy method

4) The sort which inserts each elements A(K) into proper position in the previously sorted sub array A(1), . . ., A(K –1).
   a) Insertion sort b) Radix sort c) Merge sort d) Bubble sort

5) A BST is traversed in the following order recursively : Right, root, left
   The output sequence will be in
   a) Ascending order b) Descending order
   c) Bitomic sequence d) No specific order

6) The minimum number of edges required to create a cyclic graph of n vertices is
   a) n b) n – 1 c) n + 1 d) 2n

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) 10 20 15 30 40 35 25
   c) 10 15 20 25 30 35 40 d) 40 35 30 25 20 15 10

8) Node of doubly linked list contains following fields
   a) info, next b) info, next, back
   c) front, rear d) none of the above

9) Overflow condition of queue is
   a) rear = = max – 1 b) top = = max – 1
   c) front = = max – 1 d) both a), b)

10) Stack is useful in implementing
   a) Heap b) Breadth first search
   c) Recursion d) Radix

11) When we delete an element in queue, which pointer is incremented ?
   a) Front b) Rear
   c) Both front and rear d) None of the above

12) In _____ notation the operator follows the two operands.
   a) Prefix b) Postfix
   c) Infix d) Polish

13) The result of evaluating the following postfix expression is

   5, 7, 9, *, +, 4, 9, 3, /, +, –
   a) 50 b) 65 c) 61 d) 69

14) Factorial (0) is
   a) 0 b) 1 c) infinity d) undefined

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SLR-VB – 166

Seat No.	

S.E. (E and TC) (Part – I) (CGPA Pattern) Examination, 2017
DATA STRUCTURES USING 'C'

Day and Date : Tuesday, 9-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four** questions : **(4×3=12)**
   1) Evaluate the given postfix expression : 4 2 ^ 3 * 3 – 8 4 / 11 + / +.
   2) Define recursive function and draw the recursive flow chart.
   3) Explain the representation of a polynomial using linked list.
   4) Define the function to check overflow and underflow condition of stack.
   5) Write a note on double ended queue.

3. Attempt **any one** question : **8**
   1) How to convert infix expression to postfix expression. Convert the following infix expression into postfix expression. (A + B)*C/D.
   2) WAP to implement queue using array.

4. Attempt the question : **8**

   Write a program to implement following operation on singly linked list
   a) Creation of list
   b) Insertion of element at beginning
   c) Deletion of element at end
   d) Display.

SECTION – II

5. Attempt **any four** questions : **(4×3=12)**
   1) How to represent a graph using adjacency matrix and linked list.
   2) Explain Merge sort. Sort the following sequence in ascending order using Top Down Merge sort.

      8, 5, 89, 30, 42, 92, 64, 4, 21, 56, 3
   3) Write a program to implement a selection sort method.
   4) Define Hashing. Explain following hash function with example.
      a) Folding method
      b) Division method.
   5) Describe Radix Sort. Sort the given data 24, 32, 47, 11, 56, 45 using Radix Sort.

6. Solve **any one** question : **8**
   1) Explain graph traversal methods with examples.
   2) Define Binary Search Tree. Create a binary search tree with the help of following information.

      Preorder : 67, 34, 12, 10, 45, 38, 60, 80, 78, 95, 86

      Inorder : 10, 12, 34, 38, 45, 60, 67, 78, 80, 86, 95

      Show the binary search tree after deleting the node 34 and 80.

7. 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. **8**

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SLR-VB – 166

Seat No.	

Set **R**

S.E. (E and TC) (Part – I) (CGPA Pattern) Examination, 2017
DATA STRUCTURES USING 'C'

Day and Date : Tuesday, 9-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) In _____ notation the operator follows the two operands.
   a) Prefix b) Postfix
   c) Infix d) Polish

2) The result of evaluating the following postfix expression is
   5, 7, 9, *, +, 4, 9, 3, /, +, –
   a) 50 b) 65 c) 61 d) 69

3) Factorial (0) is
   a) 0 b) 1 c) infinity d) undefined

4) If h is any hashing function and is used to hash n keys into a table of size m, where n<=m, the expected number of collisions involving a particular key x is
   a) less than 1 b) less than n c) less than m d) less than n/2

5) The worst case occur in linear search algorithm when
   a) Item is somewhere in the middle of the array
   b) Item is not in the array at all
   c) Item is the last element in the array
   d) Item is the last element in the array or item is not there at all

6) Which of the following algorithm design technique is used in the quick sort algorithm ?
   a) Dynamic programming b) Backtracking
   c) Divide-and-conquer d) Greedy method

7) The sort which inserts each elements A(K) into proper position in the previously sorted sub array A(1), . . ., A(K –1).
   a) Insertion sort b) Radix sort c) Merge sort d) Bubble sort

8) A BST is traversed in the following order recursively : Right, root, left

   The output sequence will be in
   a) Ascending order b) Descending order
   c) Bitomic sequence d) No specific order

9) The minimum number of edges required to create a cyclic graph of n vertices is
   a) n b) n – 1 c) n + 1 d) 2n

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) 10 20 15 30 40 35 25
    c) 10 15 20 25 30 35 40 d) 40 35 30 25 20 15 10

11) Node of doubly linked list contains following fields
    a) info, next b) info, next, back
    c) front, rear d) none of the above

12) Overflow condition of queue is
    a) rear = = max – 1 b) top = = max – 1
    c) front = = max – 1 d) both a), b)

13) Stack is useful in implementing
    a) Heap b) Breadth first search
    c) Recursion d) Radix

14) When we delete an element in queue, which pointer is incremented ?
    a) Front b) Rear
    c) Both front and rear d) None of the above

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SLR-VB – 166

Seat No.	

S.E. (E and TC) (Part – I) (CGPA Pattern) Examination, 2017
DATA STRUCTURES USING 'C'

Day and Date : Tuesday, 9-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four** questions : **(4×3=12)**
   1) Evaluate the given postfix expression : 4 2 ^ 3 * 3 – 8 4 / 11 + / +.
   2) Define recursive function and draw the recursive flow chart.
   3) Explain the representation of a polynomial using linked list.
   4) Define the function to check overflow and underflow condition of stack.
   5) Write a note on double ended queue.

3. Attempt **any one** question : **8**
   1) How to convert infix expression to postfix expression. Convert the following infix expression into postfix expression. (A + B)*C/D.
   2) WAP to implement queue using array.

4. Attempt the question : **8**

   Write a program to implement following operation on singly linked list
   a) Creation of list
   b) Insertion of element at beginning
   c) Deletion of element at end
   d) Display.

SECTION – II

5. Attempt **any four** questions : **(4×3=12)**
   1) How to represent a graph using adjacency matrix and linked list.
   2) Explain Merge sort. Sort the following sequence in ascending order using Top Down Merge sort.

      8, 5, 89, 30, 42, 92, 64, 4, 21, 56, 3
   3) Write a program to implement a selection sort method.
   4) Define Hashing. Explain following hash function with example.
      a) Folding method
      b) Division method.
   5) Describe Radix Sort. Sort the given data 24, 32, 47, 11, 56, 45 using Radix Sort.

6. Solve **any one** question : **8**
   1) Explain graph traversal methods with examples.
   2) Define Binary Search Tree. Create a binary search tree with the help of following information.

      Preorder : 67, 34, 12, 10, 45, 38, 60, 80, 78, 95, 86

      Inorder : 10, 12, 34, 38, 45, 60, 67, 78, 80, 86, 95

      Show the binary search tree after deleting the node 34 and 80.

7. 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. **8**

SLR-VB – 166

Seat No.	

Set S

S.E. (E and TC) (Part – I) (CGPA Pattern) Examination, 2017
DATA STRUCTURES USING 'C'

Day and Date : Tuesday, 9-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Which of the following algorithm design technique is used in the quick sort algorithm ?
   a) Dynamic programming b) Backtracking
   c) Divide-and-conquer d) Greedy method

2) The sort which inserts each elements A(K) into proper position in the previously sorted sub array A(1), . . ., A(K –1).
   a) Insertion sort b) Radix sort c) Merge sort d) Bubble sort

3) A BST is traversed in the following order recursively : Right, root, left
   The output sequence will be in
   a) Ascending order b) Descending order
   c) Bitomic sequence d) No specific order

4) The minimum number of edges required to create a cyclic graph of n vertices is
   a) n b) n – 1 c) n + 1 d) 2n

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) 10 20 15 30 40 35 25
   c) 10 15 20 25 30 35 40 d) 40 35 30 25 20 15 10

P.T.O.

6) Node of doubly linked list contains following fields
   a) info, next
   b) info, next, back
   c) front, rear
   d) none of the above

7) Overflow condition of queue is
   a) rear = = max – 1
   b) top = = max – 1
   c) front = = max – 1
   d) both a), b)

8) Stack is useful in implementing
   a) Heap
   b) Breadth first search
   c) Recursion
   d) Radix

9) When we delete an element in queue, which pointer is incremented ?
   a) Front
   b) Rear
   c) Both front and rear
   d) None of the above

10) In _____ notation the operator follows the two operands.
   a) Prefix
   b) Postfix
   c) Infix
   d) Polish

11) The result of evaluating the following postfix expression is
   5, 7, 9, *, +, 4, 9, 3, /, +, –
   a) 50 b) 65 c) 61 d) 69

12) Factorial (0) is
   a) 0 b) 1 c) infinity d) undefined

13) If h is any hashing function and is used to hash n keys into a table of size m, where n<=m, the expected number of collisions involving a particular key x is
   a) less than 1 b) less than n c) less than m d) less than n/2

14) The worst case occur in linear search algorithm when
   a) Item is somewhere in the middle of the array
   b) Item is not in the array at all
   c) Item is the last element in the array
   d) Item is the last element in the array or item is not there at all

_____

SLR-VB – 166

Seat No.	

S.E. (E and TC) (Part – I) (CGPA Pattern) Examination, 2017
DATA STRUCTURES USING 'C'

Day and Date : Tuesday, 9-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four** questions : **(4×3=12)**
   1) Evaluate the given postfix expression : 4 2 ^ 3 * 3 – 8 4 / 11 + / +.
   2) Define recursive function and draw the recursive flow chart.
   3) Explain the representation of a polynomial using linked list.
   4) Define the function to check overflow and underflow condition of stack.
   5) Write a note on double ended queue.

3. Attempt **any one** question : **8**
   1) How to convert infix expression to postfix expression. Convert the following infix expression into postfix expression. (A + B)*C/D.
   2) WAP to implement queue using array.

4. Attempt the question : **8**

   Write a program to implement following operation on singly linked list
   a) Creation of list
   b) Insertion of element at beginning
   c) Deletion of element at end
   d) Display.

SECTION – II

5. Attempt **any four** questions : **(4×3=12)**
   1) How to represent a graph using adjacency matrix and linked list.
   2) Explain Merge sort. Sort the following sequence in ascending order using Top Down Merge sort.

      8, 5, 89, 30, 42, 92, 64, 4, 21, 56, 3
   3) Write a program to implement a selection sort method.
   4) Define Hashing. Explain following hash function with example.
      a) Folding method
      b) Division method.
   5) Describe Radix Sort. Sort the given data 24, 32, 47, 11, 56, 45 using Radix Sort.

6. Solve **any one** question : **8**
   1) Explain graph traversal methods with examples.
   2) Define Binary Search Tree. Create a binary search tree with the help of following information.

      Preorder : 67, 34, 12, 10, 45, 38, 60, 80, 78, 95, 86

      Inorder : 10, 12, 34, 38, 45, 60, 67, 78, 80, 86, 95

      Show the binary search tree after deleting the node 34 and 80.

7. 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. **8**

SLR-VB – 167

Seat No.	

Set **P**

S.E. (E & TC) (CGPA) (Part – II) Examination, 2017
ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date : Tuesday, 16-5-2017 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) Figures to the right indicate full marks.

*4) Assume suitable data **wherever** required.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) In an RC coupling scheme, the coupling capacitor Cc must be large enough
   a) to pass d.c. between the stages b) not to attenuate the low frequencies
   c) to dissipate high power d) none of the above

2) When multistage amplifier is to amplify d.c. signal, then coupling used is
   a) RC b) transformer
   c) direct d) none of the above

3) When current series negative feedback is applied to an amplifier, its input impedance and output impedance respectively
   a) increases, decreases b) decreases, increase
   c) remains the same d) increases, increases

4) The piezoelectric effect in a crystal is
   a) a voltage developed because of mechanical stress
   b) change in resistance because of temperature
   c) a change of frequency because of temperature
   d) none of the above

5) The maximum efficiency of resistive load class A power amplifier is
   a) 78.5% b) 50% c) 30 d) 25%

6) In power amplifier individual distortion levels corresponding to higher harmonics are 5%, 3% and 2%. What is the total harmonic distortion ?
   a) 11.32% b) 20.2% c) 9.09% d) none of the above

7) Darlington connection will result when
   a) two CB configurations are used b) two CE configurations are used
   c) two CC configurations are used d) none of the above

8) 74123 is a _____ and 74121 _____ type of monostable multivibrator.
   a) Non-retriggerable, retriggerable
   b) Retriggerable, retriggerable
   c) Non-retriggerable, Non-retriggerable
   d) Retriggerable, Non-retriggerable

9) The output voltage of LM-317 as adjustable regulator is
   a) Vo = Vref(1+R2/R1)+IadjR2 b) Vo=Vref(1+R1/R2)+IadjR1
   c) Vo=Vref(R2+R1)+IadjR2 d) Vo=Vref(R2/R1)+IadjR2

10) Regulated output voltage of fixed voltage regulator 7805 is
   a) 1.25V b) 1V c) 0.25V d) 5V

11) Divide by N network can be designed by _____ Multivibrator.
   a) Astable b) Monostable c) Bistable d) Divider

12) In Astable multivibrator using IC-555 R_A =10 KΩ , R_B=10KΩ and C= 0 .1 μf then the duty cycle of output waveform is
   a) 50% b) 60% c) 33.33% d) 66.67%

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

14) Power dissipation in transistor in case of Astable multivibrator depends on
   a) Vcc b) Collector resistor (Rc)
   c) Vcc & Rc d) None

SLR-VB – 167

Seat No.	

S.E. (E & TC) (CGPA) (Part – II) Examination, 2017
ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date : Tuesday, 16-5-2017 Marks : 56

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

Instructions : *1) Figures to the right indicate **full** marks.*

*2) Assume suitable data **wherever** required.*

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) State Barkhausen's criterion. How oscillator circuits are classified by considering different parameters ?

b) For an amplifier total harmonic distortion is reduced from 8% to 2% when 5% negative feedback is used. What was the gain of an amplifier when distortion was 8% and gain of an amplifier when distortion is 2% ?

c) Verify that for multistage amplifier overall voltage gain is the product of individual stage gains when expressed in linear scale and sum when expressed in dB scale.

d) Explain the method for biasing an emitter follower circuit.

e) The introduction of feedback reduces the voltage gain of an amplifier from 100 to 25. In the absence of feedback the output signal distortion factor is 0.1, calculate distortion factor in presence of feedback.

3. Solve the following : **(6×2=12)**

a) Design single stage RC coupled amplifier for the following requirements.

Voltage gain = 150, O/P voltage = 5v (rms), current gain = 250,
power supply =15V, stability factor =3, RL = 1K.

Calculate voltage gain when CE (emitter bypassed capacitor) is removed.

b) Design Wein bridge oscillator circuit for O/P freq. 5KHz using transistor.

Transistor used is having following specifications-hfe = 250, hie = 1.5k, VCE max= 45 V, Stability factor = 4, VBE = 0.6V

OR

b) Draw the circuit diagram of Class B push pull power amplifier and Derive the equation for it's conversion efficiency.

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) List performance parameters of three terminal fixed IC voltage regulators.

b) Design a circuit to turn ON LED for 12 sec after applying trigger pulse, Initially the LED is in off condition.

c) Design an adjustable vtg regulator using LM-317 to satisfy following Vo= 8 to 18V. for output current of 1A.

d) Explain different triggering methods in transistorized multivibrater circuits.

e) Draw transistor Schmitt trigger circuit with its Input, Output waveform and Hysterisis curve.

5. Answer **any two** : **(2×6=12)**

a) Design a transistorized series voltage regulator for 15V at 200mA. The unregulated power supply provides output of 25V. Select transistor with following specification.

ECN100 $PD_{(max)}$ = 5W, hfe = 50

BC147B $PD_{(max)}$ =250 mW, hfe =200

b) Design a dual tracking regulator using three terminal adjustable IC voltage regulators for following specification :

i) Vo = $\pm$ 10V to $\pm$ 24V

ii) I_o=1.2A

iii) Vin = 35V, use R1 = 240 Ω , I_{adj} = 100 μ A

c) Explain power on delay using IC-555 and design delay circuit to generate a delay 10 sec after applying trigger pulse.

Set P

SLR-VB – 167

Seat No.	

Set **Q**

S.E. (E & TC) (CGPA) (Part – II) Examination, 2017
ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date : Tuesday, 16-5-2017 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) Figures to the right indicate full marks.

*4) Assume suitable data **wherever** required.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) 74123 is a _____ and 74121 _____ type of monostable multivibrator.

a) Non-retriggerable, retriggerable

b) Retriggerable, retriggerable

c) Non-retriggerable, Non-retriggerable

d) Retriggerable, Non-retriggerable

2) The output voltage of LM-317 as adjustable regulator is

a) Vo = Vref(1+R2/R1)+IadjR2 b) Vo=Vref(1+R1/R2)+IadjR1

c) Vo=Vref(R2+R1)+IadjR2 d) Vo=Vref(R2/R1)+IadjR2

3) Regulated output voltage of fixed voltage regulator 7805 is

a) 1.25V b) 1V c) 0.25V d) 5V

4) Divide by N network can be designed by _____ Multivibrator.

a) Astable b) Monostable c) Bistable d) Divider

P.T.O.

5) In Astable multivibrator using IC-555 R_A =10 KΩ , R_B=10KΩ and C= 0 .1 μ f then the duty cycle of output waveform is
   a) 50% b) 60% c) 33.33% d) 66.67%

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

7) Power dissipation in transistor in case of Astable multivibrator depends on
   a) Vcc b) Collector resistor (Rc)
   c) Vcc & Rc d) None

8) In an RC coupling scheme, the coupling capacitor Cc must be large enough
   a) to pass d.c. between the stages b) not to attenuate the low frequencies
   c) to dissipate high power d) none of the above

9) When multistage amplifier is to amplify d.c. signal, then coupling used is
   a) RC b) transformer
   c) direct d) none of the above

10) When current series negative feedback is applied to an amplifier, its input impedance and output impedance respectively
   a) increases, decreases b) decreases, increase
   c) remains the same d) increases, increases

11) The piezoelectric effect in a crystal is
   a) a voltage developed because of mechanical stress
   b) change in resistance because of temperature
   c) a change of frequency because of temperature
   d) none of the above

12) The maximum efficiency of resistive load class A power amplifier is
   a) 78.5% b) 50% c) 30 d) 25%

13) In power amplifier individual distortion levels corresponding to higher harmonics are 5%, 3% and 2%. What is the total harmonic distortion ?
   a) 11.32% b) 20.2% c) 9.09% d) none of the above

14) Darlington connection will result when
   a) two CB configurations are used b) two CE configurations are used
   c) two CC configurations are used d) none of the above

SLR-VB – 167

Seat No.	

S.E. (E & TC) (CGPA) (Part – II) Examination, 2017
ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date : Tuesday, 16-5-2017 Marks : 56

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

Instructions : *1) Figures to the right indicate **full** marks.*

*2) Assume suitable data **wherever** required.*

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) State Barkhausen's criterion. How oscillator circuits are classified by considering different parameters ?

b) For an amplifier total harmonic distortion is reduced from 8% to 2% when 5% negative feedback is used. What was the gain of an amplifier when distortion was 8% and gain of an amplifier when distortion is 2% ?

c) Verify that for multistage amplifier overall voltage gain is the product of individual stage gains when expressed in linear scale and sum when expressed in dB scale.

d) Explain the method for biasing an emitter follower circuit.

e) The introduction of feedback reduces the voltage gain of an amplifier from 100 to 25. In the absence of feedback the output signal distortion factor is 0.1, calculate distortion factor in presence of feedback.

3. Solve the following : **(6×2=12)**

a) Design single stage RC coupled amplifier for the following requirements.

Voltage gain = 150, O/P voltage = 5v (rms), current gain = 250,
power supply =15V, stability factor =3, RL = 1K.

Calculate voltage gain when CE (emitter bypassed capacitor) is removed.

b) Design Wein bridge oscillator circuit for O/P freq. 5KHz using transistor.

Transistor used is having following specifications-hfe = 250, hie = 1.5k, VCE max= 45 V, Stability factor = 4, VBE = 0.6V

OR

b) Draw the circuit diagram of Class B push pull power amplifier and Derive the equation for it's conversion efficiency.

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) List performance parameters of three terminal fixed IC voltage regulators.

b) Design a circuit to turn ON LED for 12 sec after applying trigger pulse, Initially the LED is in off condition.

c) Design an adjustable vtg regulator using LM-317 to satisfy following Vo= 8 to 18V. for output current of 1A.

d) Explain different triggering methods in transistorized multivibrater circuits.

e) Draw transistor Schmitt trigger circuit with its Input, Output waveform and Hysterisis curve.

5. Answer **any two** : **(2×6=12)**

a) Design a transistorized series voltage regulator for 15V at 200mA. The unregulated power supply provides output of 25V. Select transistor with following specification.

ECN100 $PD_{(max)}$ = 5W, hfe = 50

BC147B $PD_{(max)}$ =250 mW, hfe =200

b) Design a dual tracking regulator using three terminal adjustable IC voltage regulators for following specification :

i) Vo = $\pm$ 10V to $\pm$ 24V

ii) I_o=1.2A

iii) Vin = 35V, use R1 = 240 Ω , I_{adj} = 100 μ A

c) Explain power on delay using IC-555 and design delay circuit to generate a delay 10 sec after applying trigger pulse.

Set Q

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SLR-VB – 167

Seat No.	

Set R

S.E. (E & TC) (CGPA) (Part – II) Examination, 2017
ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date : Tuesday, 16-5-2017 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) Figures to the right indicate full marks.

*4) Assume suitable data **wherever** required.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The maximum efficiency of resistive load class A power amplifier is
   a) 78.5% b) 50% c) 30 d) 25%

2) In power amplifier individual distortion levels corresponding to higher harmonics are 5%, 3% and 2%. What is the total harmonic distortion ?
   a) 11.32% b) 20.2% c) 9.09% d) none of the above

3) Darlington connection will result when
   a) two CB configurations are used b) two CE configurations are used
   c) two CC configurations are used d) none of the above

4) 74123 is a _____ and 74121 _____ type of monostable multivibrator.
   a) Non-retriggerable, retriggerable
   b) Retriggerable, retriggerable
   c) Non-retriggerable, Non-retriggerable
   d) Retriggerable, Non-retriggerable

P.T.O.

5) The output voltage of LM-317 as adjustable regulator is
   a) Vo = Vref(1+R2/R1)+IadjR2 b) Vo=Vref(1+R1/R2)+IadjR1
   c) Vo=Vref(R2+R1)+IadjR2 d) Vo=Vref(R2/R1)+IadjR2
6) Regulated output voltage of fixed voltage regulator 7805 is
   a) 1.25V b) 1V c) 0.25V d) 5V
7) Divide by N network can be designed by _____ Multivibrator.
   a) Astable b) Monostable c) Bistable d) Divider
8) In Astable multivibrator using IC-555 R_A =10 KΩ , R_B=10KΩ and C= 0 .1 μf then the duty cycle of output waveform is
   a) 50% b) 60% c) 33.33% d) 66.67%
9) Pre regulator in voltage regulator acts as
   a) Reference voltage source b) Constant current source
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10) Power dissipation in transistor in case of Astable multivibrator depends on
   a) Vcc b) Collector resistor (Rc)
   c) Vcc & Rc d) None
11) In an RC coupling scheme, the coupling capacitor Cc must be large enough
   a) to pass d.c. between the stages b) not to attenuate the low frequencies
   c) to dissipate high power d) none of the above
12) When multistage amplifier is to amplify d.c. signal, then coupling used is
   a) RC b) transformer
   c) direct d) none of the above
13) When current series negative feedback is applied to an amplifier, its input impedance and output impedance respectively
   a) increases, decreases b) decreases, increase
   c) remains the same d) increases, increases
14) The piezoelectric effect in a crystal is
   a) a voltage developed because of mechanical stress
   b) change in resistance because of temperature
   c) a change of frequency because of temperature
   d) none of the above

_____

SLR-VB – 167

Seat No.	

S.E. (E & TC) (CGPA) (Part – II) Examination, 2017
ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date : Tuesday, 16-5-2017 Marks : 56

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

Instructions : *1) Figures to the right indicate **full** marks.*

*2) Assume suitable data **wherever** required.*

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) State Barkhausen's criterion. How oscillator circuits are classified by considering different parameters ?

b) For an amplifier total harmonic distortion is reduced from 8% to 2% when 5% negative feedback is used. What was the gain of an amplifier when distortion was 8% and gain of an amplifier when distortion is 2% ?

c) Verify that for multistage amplifier overall voltage gain is the product of individual stage gains when expressed in linear scale and sum when expressed in dB scale.

d) Explain the method for biasing an emitter follower circuit.

e) The introduction of feedback reduces the voltage gain of an amplifier from 100 to 25. In the absence of feedback the output signal distortion factor is 0.1, calculate distortion factor in presence of feedback.

3. Solve the following : **(6×2=12)**

a) Design single stage RC coupled amplifier for the following requirements.

Voltage gain = 150, O/P voltage = 5v (rms), current gain = 250,
power supply =15V, stability factor =3, RL = 1K.

Calculate voltage gain when CE (emitter bypassed capacitor) is removed.

b) Design Wein bridge oscillator circuit for O/P freq. 5KHz using transistor.

Transistor used is having following specifications-hfe = 250, hie = 1.5k, VCE max= 45 V, Stability factor = 4, VBE = 0.6V

OR

b) Draw the circuit diagram of Class B push pull power amplifier and Derive the equation for it's conversion efficiency.

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) List performance parameters of three terminal fixed IC voltage regulators.

b) Design a circuit to turn ON LED for 12 sec after applying trigger pulse, Initially the LED is in off condition.

c) Design an adjustable vtg regulator using LM-317 to satisfy following Vo= 8 to 18V. for output current of 1A.

d) Explain different triggering methods in transistorized multivibrater circuits.

e) Draw transistor Schmitt trigger circuit with its Input, Output waveform and Hysterisis curve.

5. Answer **any two** : **(2×6=12)**

a) Design a transistorized series voltage regulator for 15V at 200mA. The unregulated power supply provides output of 25V. Select transistor with following specification.

ECN100 $PD_{(max)}$ = 5W, hfe = 50

BC147B $PD_{(max)}$ =250 mW, hfe =200

b) Design a dual tracking regulator using three terminal adjustable IC voltage regulators for following specification :

i) Vo = $\pm$ 10V to $\pm$ 24V

ii) I_o=1.2A

iii) Vin = 35V, use R1 = 240 Ω , I_{adj} = 100 μ A

c) Explain power on delay using IC-555 and design delay circuit to generate a delay 10 sec after applying trigger pulse.

Set R

SLR-VB – 167

Seat No.	

Set **S**

S.E. (E & TC) (CGPA) (Part – II) Examination, 2017
ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date : Tuesday, 16-5-2017 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) Figures to the right indicate full marks.

*4) Assume suitable data **wherever** required.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Regulated output voltage of fixed voltage regulator 7805 is

a) 1.25V b) 1V c) 0.25V d) 5V

2) Divide by N network can be designed by _____ Multivibrator.

a) Astable b) Monostable c) Bistable d) Divider

3) In Astable multivibrator using IC-555 R_A =10 KΩ , R_B=10KΩ and C= 0 .1 μ f then the duty cycle of output waveform is

a) 50% b) 60% c) 33.33% d) 66.67%

4) Pre regulator in voltage regulator acts as

a) Reference voltage source b) Constant current source

c) Pre amplifier d) All above

5) Power dissipation in transistor in case of Astable multivibrator depends on

a) Vcc b) Collector resistor (Rc)

c) Vcc & Rc d) None

6) In an RC coupling scheme, the coupling capacitor Cc must be large enough

a) to pass d.c. between the stages b) not to attenuate the low frequencies

c) to dissipate high power d) none of the above

P.T.O.

7) When multistage amplifier is to amplify d.c. signal, then coupling used is
   a) RC b) transformer
   c) direct d) none of the above

8) When current series negative feedback is applied to an amplifier, its input impedance and output impedance respectively
   a) increases, decreases b) decreases, increase
   c) remains the same d) increases, increases

9) The piezoelectric effect in a crystal is
   a) a voltage developed because of mechanical stress
   b) change in resistance because of temperature
   c) a change of frequency because of temperature
   d) none of the above

10) The maximum efficiency of resistive load class A power amplifier is
   a) 78.5% b) 50% c) 30 d) 25%

11) In power amplifier individual distortion levels corresponding to higher harmonics are 5%, 3% and 2%. What is the total harmonic distortion ?
   a) 11.32% b) 20.2% c) 9.09% d) none of the above

12) Darlington connection will result when
   a) two CB configurations are used b) two CE configurations are used
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13) 74123 is a _____ and 74121 _____ type of monostable multivibrator.
   a) Non-retriggerable, retriggerable
   b) Retriggerable, retriggerable
   c) Non-retriggerable, Non-retriggerable
   d) Retriggerable, Non-retriggerable

14) The output voltage of LM-317 as adjustable regulator is
   a) Vo = Vref(1+R2/R1)+IadjR2 b) Vo=Vref(1+R1/R2)+IadjR1
   c) Vo=Vref(R2+R1)+IadjR2 d) Vo=Vref(R2/R1)+IadjR2

SLR-VB – 167

Seat No.	

S.E. (E & TC) (CGPA) (Part – II) Examination, 2017
ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date : Tuesday, 16-5-2017 Marks : 56

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

Instructions : *1) Figures to the right indicate **full** marks.*

*2) Assume suitable data **wherever** required.*

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) State Barkhausen's criterion. How oscillator circuits are classified by considering different parameters ?

b) For an amplifier total harmonic distortion is reduced from 8% to 2% when 5% negative feedback is used. What was the gain of an amplifier when distortion was 8% and gain of an amplifier when distortion is 2% ?

c) Verify that for multistage amplifier overall voltage gain is the product of individual stage gains when expressed in linear scale and sum when expressed in dB scale.

d) Explain the method for biasing an emitter follower circuit.

e) The introduction of feedback reduces the voltage gain of an amplifier from 100 to 25. In the absence of feedback the output signal distortion factor is 0.1, calculate distortion factor in presence of feedback.

3. Solve the following : **(6×2=12)**

a) Design single stage RC coupled amplifier for the following requirements.

Voltage gain = 150, O/P voltage = 5v (rms), current gain = 250,
power supply =15V, stability factor =3, RL = 1K.

Calculate voltage gain when CE (emitter bypassed capacitor) is removed.

b) Design Wein bridge oscillator circuit for O/P freq. 5KHz using transistor.

Transistor used is having following specifications-hfe = 250, hie = 1.5k, VCE max= 45 V, Stability factor = 4, VBE = 0.6V

OR

b) Draw the circuit diagram of Class B push pull power amplifier and Derive the equation for it's conversion efficiency.

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) List performance parameters of three terminal fixed IC voltage regulators.

b) Design a circuit to turn ON LED for 12 sec after applying trigger pulse, Initially the LED is in off condition.

c) Design an adjustable vtg regulator using LM-317 to satisfy following Vo= 8 to 18V. for output current of 1A.

d) Explain different triggering methods in transistorized multivibrater circuits.

e) Draw transistor Schmitt trigger circuit with its Input, Output waveform and Hysterisis curve.

5. Answer **any two** : **(2×6=12)**

a) Design a transistorized series voltage regulator for 15V at 200mA. The unregulated power supply provides output of 25V. Select transistor with following specification.

ECN100 $PD_{(max)}$ = 5W, hfe = 50

BC147B $PD_{(max)}$ =250 mW, hfe =200

b) Design a dual tracking regulator using three terminal adjustable IC voltage regulators for following specification :

i) Vo = $\pm$ 10V to $\pm$ 24V

ii) I_o=1.2A

iii) Vin = 35V, use R1 = 240 Ω , I_{adj} = 100 μ A

c) Explain power on delay using IC-555 and design delay circuit to generate a delay 10 sec after applying trigger pulse.

Set S

SLR-VB – 168

Seat No.	

Set **P**

S.E. (E & TC) (Part – II) (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 18-5-2017 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) Good selectivity usually means _____ bandwidth.
   a) Wide b) Narrow
   c) None of these d) Independent of BW

2) A receiver that uses a mixer to convert the received signal at a lower frequency is called as _____ receiver.
   a) Super heterodyne b) TRF
   c) Ratio d) Armstrong

3) The total sideband power in AM is _____
   a) $m^2/2$ b) $(1 + m^2/2)$
   c) $(1 + m^2/4)\ P_c$ d) $(m^2/2)\ P_c$

4) Over modulation occurs when
   a) $V_m > V_c$ b) $V_m < V_c$
   c) $V_m = V_c$ d) V_m is 50% to that of V_c

5) The modulation index at detector is usually _____ than the modulation index at transmitter.
   a) Greater b) Less c) Equal d) None of these

P.T.O.

6) The equivalent noise temperature Teq of communication system varies
   a) Linearly with To b) Linearly with To^2
   c) Linearly with 1/To d) Linearly with $1/To^2$

7) The M. I. of an AM wave is 50%. If carrier and one of the sideband is suppressed then the percentage power saving is _____
   a) 66.66% b) 83.33% c) 50% d) 94.44%

8) The bandwidth in frequency modulation can be calculated as
   a) $2(\delta + f_m)$ b) $2(m_f+1)\, f_m$ c) $2nf_m$ d) All of these

9) Armstrong FM transmitter performs frequency multiplication in stages
   a) To increase the overall S/N ratio
   b) To reduce BW
   c) To find the desired value of carrier
   d) For convenience frequency as well as frequency deviation

10) To boost high frequencies _____ circuit is used.
   a) Amplifier b) De-emphasis
   c) Pre-emphasis d) Filters

11) The antenna that radiates the signal in one direction is called
   a) Multidirectional b) Unidirectional
   c) Omnidirectional d) Bidirectional

12) Which is not the unit of traffic measurement in telephony ?
   a) Erlang b) CCM c) CS d) CM

13) Radio horizon lie _____ the optical horizon.
   a) Same b) Before c) Beyond d) None of these

14) A telephone is _____ system.
   a) Simplex b) Half duplex c) Full duplex d) None of these

_____

SLR-VB – 168

Seat No.	

S.E. (E & TC) (Part – II) (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 18-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

SECTION – I

2. Attempt **any three** : **(3×5=15)**

   a) Explain the need of modulation in detail.

   b) The antenna current of an AM transmitter is 8 A when only the carrier is sent, but it increases to 8.93 A when the carrier is modulated by a single sine wave. Find the percentage of modulation. Determine the antenna current if depth of modulation changes to 0.8.

   c) Derive the equation of Power in AM.

   d) Write a note on filter method of SSB generation.

   e) Calculate the noise voltage at the input of a TV amplifier using a device that has a 200Ω equivalent noise resistance and a 300Ω input resistor. The bandwidth of the amplifier is 6 MHz and the temperature is 17 degree centigrade.

3. a) An audio frequency signal 10 sin ($2\pi \times 500t$) is use to amplitude modulate a carrier of 50 sin ($2\pi \times 10^5 t$). Calculate Modulation Index, Side Band Frequency, Amplitude of each sideband and bandwidth required. **5**

   b) Attempt **any one** of the following : **(1×8=8)**

      i) Derive an expression of noise figure.

      ii) Briefly explain the characteristics of radio receiver.

SECTION – II

4. Attempt **any three** : **(3×5=15)**

   a) Write a short note on Tropospheric Scatter Propagation.

   b) Describe the tones used in automatic exchange.

   c) Define :

      i) Beam width

      ii) Directive gain

      iii) Front to back ratio

      iv) Efficiency.

   d) Write a short note on sky wave propagation.

   e) Write a short note on emphasis network.

5. a) In case of Space Wave Propagation, show the maximum distance between transmitter and receiver is $4(\sqrt{h_T} + \sqrt{h_R})$, where h_T is height of transmitter and h_R is height of receiver, with the help of radio horizon. **5**

   b) Attempt **any one** : **(1×8=8)**

      i) With the circuit diagram and phasor diagram, explain the working of Foster Seelay Discriminator.

      ii) In an FM system, when the audio frequency is 500 Hz and modulating voltage is 2.5 V, the deviation produced is 5 kHz. If the modulating voltage is now raised to 7.5 V. Calculate new value of frequency deviation produced. If the AF voltage is now increased to 10 V while the modulating frequency is dropped to 250 Hz, what is the frequency deviation. Also calculate M.I. in each case.

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SLR-VB – 168

Seat No.	

Set **Q**

S.E. (E & TC) (Part – II) (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 18-5-2017 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) The bandwidth in frequency modulation can be calculated as
   a) $2(\delta + f_m)$ b) $2(m_f+1)\, f_m$ c) $2nf_m$ d) All of these

2) Armstrong FM transmitter performs frequency multiplication in stages
   a) To increase the overall S/N ratio
   b) To reduce BW
   c) To find the desired value of carrier
   d) For convenience frequency as well as frequency deviation

3) To boost high frequencies _____ circuit is used.
   a) Amplifier b) De-emphasis
   c) Pre-emphasis d) Filters

4) The antenna that radiates the signal in one direction is called
   a) Multidirectional b) Unidirectional
   c) Omnidirectional d) Bidirectional

5) Which is not the unit of traffic measurement in telephony ?
   a) Erlang b) CCM c) CS d) CM

6) Radio horizon lie _____ the optical horizon.
   a) Same b) Before c) Beyond d) None of these

P.T.O.

7) A telephone is _____ system.
   a) Simplex b) Half duplex c) Full duplex d) None of these

8) Good selectivity usually means _____ bandwidth.
   a) Wide b) Narrow
   c) None of these d) Independent of BW

9) A receiver that uses a mixer to convert the received signal at a lower frequency is called as _____ receiver.
   a) Super heterodyne b) TRF
   c) Ratio d) Armstrong

10) The total sideband power in AM is _____
   a) $m^2/2$ b) $(1 + m^2/2)$
   c) $(1 + m^2/4)\ P_c$ d) $(m^2/2)\ P_c$

11) Over modulation occurs when
   a) $V_m > V_c$ b) $V_m < V_c$
   c) $V_m = V_c$ d) V_m is 50% to that of V_c

12) The modulation index at detector is usually _____ than the modulation index at transmitter.
   a) Greater b) Less c) Equal d) None of these

13) The equivalent noise temperature Teq of communication system varies
   a) Linearly with To b) Linearly with To^2
   c) Linearly with 1/To d) Linearly with $1/To^2$

14) The M. I. of an AM wave is 50%. If carrier and one of the sideband is suppressed then the percentage power saving is _____
   a) 66.66% b) 83.33% c) 50% d) 94.44%

_____

SLR-VB – 168

Seat No.	

S.E. (E & TC) (Part – II) (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 18-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

SECTION – I

2. Attempt **any three** : **(3×5=15)**

   a) Explain the need of modulation in detail.

   b) The antenna current of an AM transmitter is 8 A when only the carrier is sent, but it increases to 8.93 A when the carrier is modulated by a single sine wave. Find the percentage of modulation. Determine the antenna current if depth of modulation changes to 0.8.

   c) Derive the equation of Power in AM.

   d) Write a note on filter method of SSB generation.

   e) Calculate the noise voltage at the input of a TV amplifier using a device that has a 200Ω equivalent noise resistance and a 300Ω input resistor. The bandwidth of the amplifier is 6 MHz and the temperature is 17 degree centigrade.

3. a) An audio frequency signal 10 sin ($2\pi \times 500t$) is use to amplitude modulate a carrier of 50 sin ($2\pi \times 10^5 t$). Calculate Modulation Index, Side Band Frequency, Amplitude of each sideband and bandwidth required. **5**

   b) Attempt **any one** of the following : **(1×8=8)**

      i) Derive an expression of noise figure.

      ii) Briefly explain the characteristics of radio receiver.

SECTION – II

4. Attempt **any three** : **(3×5=15)**

   a) Write a short note on Tropospheric Scatter Propagation.

   b) Describe the tones used in automatic exchange.

   c) Define :

      i) Beam width

      ii) Directive gain

      iii) Front to back ratio

      iv) Efficiency.

   d) Write a short note on sky wave propagation.

   e) Write a short note on emphasis network.

5. a) In case of Space Wave Propagation, show the maximum distance between transmitter and receiver is $4(\sqrt{h_T} + \sqrt{h_R})$, where h_T is height of transmitter and h_R is height of receiver, with the help of radio horizon. **5**

   b) Attempt **any one** : **(1×8=8)**

      i) With the circuit diagram and phasor diagram, explain the working of Foster Seelay Discriminator.

      ii) In an FM system, when the audio frequency is 500 Hz and modulating voltage is 2.5 V, the deviation produced is 5 kHz. If the modulating voltage is now raised to 7.5 V. Calculate new value of frequency deviation produced. If the AF voltage is now increased to 10 V while the modulating frequency is dropped to 250 Hz, what is the frequency deviation. Also calculate M.I. in each case.

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SLR-VB – 168

Seat No.	

Set **R**

S.E. (E & TC) (Part – II) (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 18-5-2017 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) The modulation index at detector is usually _____ than the modulation index at transmitter.
   a) Greater b) Less c) Equal d) None of these

2) The equivalent noise temperature Teq of communication system varies
   a) Linearly with To b) Linearly with To^2
   c) Linearly with 1/To d) Linearly with $1/To^2$

3) The M. I. of an AM wave is 50%. If carrier and one of the sideband is suppressed then the percentage power saving is _____
   a) 66.66% b) 83.33% c) 50% d) 94.44%

4) The bandwidth in frequency modulation can be calculated as
   a) $2(\delta + f_m)$ b) $2(m_f+1)\, f_m$ c) $2nf_m$ d) All of these

5) Armstrong FM transmitter performs frequency multiplication in stages
   a) To increase the overall S/N ratio
   b) To reduce BW
   c) To find the desired value of carrier
   d) For convenience frequency as well as frequency deviation

6) To boost high frequencies _____ circuit is used.
   a) Amplifier b) De-emphasis
   c) Pre-emphasis d) Filters

7) The antenna that radiates the signal in one direction is called
   a) Multidirectional b) Unidirectional
   c) Omnidirectional d) Bidirectional

8) Which is not the unit of traffic measurement in telephony ?
   a) Erlang b) CCM c) CS d) CM

9) Radio horizon lie _____ the optical horizon.
   a) Same b) Before c) Beyond d) None of these

10) A telephone is _____ system.
   a) Simplex b) Half duplex c) Full duplex d) None of these

11) Good selectivity usually means _____ bandwidth.
   a) Wide b) Narrow
   c) None of these d) Independent of BW

12) A receiver that uses a mixer to convert the received signal at a lower frequency is called as _____ receiver.
   a) Super heterodyne b) TRF
   c) Ratio d) Armstrong

13) The total sideband power in AM is _____
   a) $m^2/2$ b) $(1 + m^2/2)$
   c) $(1 + m^2/4)\ P_c$ d) $(m^2/2)\ P_c$

14) Over modulation occurs when
   a) $V_m > V_c$ b) $V_m < V_c$
   c) $V_m = V_c$ d) V_m is 50% to that of V_c

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SLR-VB – 168

Seat No.	

S.E. (E & TC) (Part – II) (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 18-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

SECTION – I

2. Attempt **any three** : **(3×5=15)**

   a) Explain the need of modulation in detail.

   b) The antenna current of an AM transmitter is 8 A when only the carrier is sent, but it increases to 8.93 A when the carrier is modulated by a single sine wave. Find the percentage of modulation. Determine the antenna current if depth of modulation changes to 0.8.

   c) Derive the equation of Power in AM.

   d) Write a note on filter method of SSB generation.

   e) Calculate the noise voltage at the input of a TV amplifier using a device that has a 200Ω equivalent noise resistance and a 300Ω input resistor. The bandwidth of the amplifier is 6 MHz and the temperature is 17 degree centigrade.

3. a) An audio frequency signal 10 sin ($2\pi \times 500t$) is use to amplitude modulate a carrier of 50 sin ($2\pi \times 10^5 t$). Calculate Modulation Index, Side Band Frequency, Amplitude of each sideband and bandwidth required. **5**

   b) Attempt **any one** of the following : **(1×8=8)**

      i) Derive an expression of noise figure.

      ii) Briefly explain the characteristics of radio receiver.

SECTION – II

4. Attempt **any three** : **(3×5=15)**

   a) Write a short note on Tropospheric Scatter Propagation.

   b) Describe the tones used in automatic exchange.

   c) Define :

      i) Beam width

      ii) Directive gain

      iii) Front to back ratio

      iv) Efficiency.

   d) Write a short note on sky wave propagation.

   e) Write a short note on emphasis network.

5. a) In case of Space Wave Propagation, show the maximum distance between transmitter and receiver is $4(\sqrt{h_T} + \sqrt{h_R})$, where h_T is height of transmitter and h_R is height of receiver, with the help of radio horizon. **5**

   b) Attempt **any one** : **(1×8=8)**

      i) With the circuit diagram and phasor diagram, explain the working of Foster Seelay Discriminator.

      ii) In an FM system, when the audio frequency is 500 Hz and modulating voltage is 2.5 V, the deviation produced is 5 kHz. If the modulating voltage is now raised to 7.5 V. Calculate new value of frequency deviation produced. If the AF voltage is now increased to 10 V while the modulating frequency is dropped to 250 Hz, what is the frequency deviation. Also calculate M.I. in each case.

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SLR-VB – 168

Seat No.	

Set **S**

S.E. (E & TC) (Part – II) (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 18-5-2017 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) To boost high frequencies _____ circuit is used.
   a) Amplifier b) De-emphasis
   c) Pre-emphasis d) Filters

2) The antenna that radiates the signal in one direction is called
   a) Multidirectional b) Unidirectional
   c) Omnidirectional d) Bidirectional

3) Which is not the unit of traffic measurement in telephony ?
   a) Erlang b) CCM c) CS d) CM

4) Radio horizon lie _____ the optical horizon.
   a) Same b) Before c) Beyond d) None of these

5) A telephone is _____ system.
   a) Simplex b) Half duplex
   c) Full duplex d) None of these

6) Good selectivity usually means _____ bandwidth.
   a) Wide b) Narrow
   c) None of these d) Independent of BW

7) A receiver that uses a mixer to convert the received signal at a lower frequency is called as _____ receiver.
   a) Super heterodyne b) TRF
   c) Ratio d) Armstrong

8) The total sideband power in AM is _____
   a) $m^2/2$ b) $(1 + m^2/2)$
   c) $(1 + m^2/4) P_c$ d) $(m^2/2) P_c$

9) Over modulation occurs when
   a) $V_m > V_c$ b) $V_m < V_c$
   c) $V_m = V_c$ d) V_m is 50% to that of V_c

10) The modulation index at detector is usually _____ than the modulation index at transmitter.
   a) Greater b) Less c) Equal d) None of these

11) The equivalent noise temperature Teq of communication system varies
   a) Linearly with To b) Linearly with To^2
   c) Linearly with 1/To d) Linearly with $1/To^2$

12) The M. I. of an AM wave is 50%. If carrier and one of the sideband is suppressed then the percentage power saving is _____
   a) 66.66% b) 83.33% c) 50% d) 94.44%

13) The bandwidth in frequency modulation can be calculated as
   a) $2(\delta + f_m)$ b) $2(m_f+1) f_m$ c) $2nf_m$ d) All of these

14) Armstrong FM transmitter performs frequency multiplication in stages
   a) To increase the overall S/N ratio
   b) To reduce BW
   c) To find the desired value of carrier
   d) For convenience frequency as well as frequency deviation

_____

SLR-VB – 168

Seat No.	

S.E. (E & TC) (Part – II) (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 18-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

SECTION – I

2. Attempt **any three** : **(3×5=15)**

   a) Explain the need of modulation in detail.

   b) The antenna current of an AM transmitter is 8 A when only the carrier is sent, but it increases to 8.93 A when the carrier is modulated by a single sine wave. Find the percentage of modulation. Determine the antenna current if depth of modulation changes to 0.8.

   c) Derive the equation of Power in AM.

   d) Write a note on filter method of SSB generation.

   e) Calculate the noise voltage at the input of a TV amplifier using a device that has a 200Ω equivalent noise resistance and a 300Ω input resistor. The bandwidth of the amplifier is 6 MHz and the temperature is 17 degree centigrade.

3. a) An audio frequency signal 10 sin ($2\pi \times 500t$) is use to amplitude modulate a carrier of 50 sin ($2\pi \times 10^5 t$). Calculate Modulation Index, Side Band Frequency, Amplitude of each sideband and bandwidth required. **5**

   b) Attempt **any one** of the following : **(1×8=8)**

      i) Derive an expression of noise figure.

      ii) Briefly explain the characteristics of radio receiver.

SECTION – II

4. Attempt **any three** : **(3×5=15)**
   a) Write a short note on Tropospheric Scatter Propagation.
   b) Describe the tones used in automatic exchange.
   c) Define :
      i) Beam width
      ii) Directive gain
      iii) Front to back ratio
      iv) Efficiency.
   d) Write a short note on sky wave propagation.
   e) Write a short note on emphasis network.

5. a) In case of Space Wave Propagation, show the maximum distance between transmitter and receiver is $4(\sqrt{h_T} + \sqrt{h_R})$, where h_T is height of transmitter and h_R is height of receiver, with the help of radio horizon. **5**
   b) Attempt **any one** : **(1×8=8)**
      i) With the circuit diagram and phasor diagram, explain the working of Foster Seelay Discriminator.
      ii) In an FM system, when the audio frequency is 500 Hz and modulating voltage is 2.5 V, the deviation produced is 5 kHz. If the modulating voltage is now raised to 7.5 V. Calculate new value of frequency deviation produced. If the AF voltage is now increased to 10 V while the modulating frequency is dropped to 250 Hz, what is the frequency deviation. Also calculate M.I. in each case.

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SLR-VB – 169

Seat No.	

Set P

S.E. (E&TC) (Part – II) (CGPA) Examination, 2017
CONTROL SYSTEM

Day and Date : Saturday, 20-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

***Instructions** : 1) **Assum**e 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 answer :

1) In force-voltage analogy, velocity is analogous to
a) current b) charge c) inductance d) capacitance

2) Type 2 system has _____ at the origin.
a) No pole b) No zero c) Simple pole d) two poles

3) The impulse response of a LTI system is a unit step function, then the corresponding transfer function is
a) $\frac{1}{s}$ b) $\frac{1}{s^2}$ c) 1 d) s

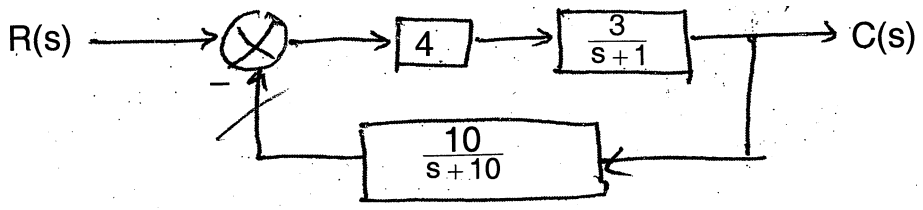
4) The equation $s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$ has _____ roots in the right half of s-plane.
a) one b) zero c) two d) three

5) Given a unity feedback control system with $G(s) = \frac{K}{s(s+4)}$, the value of K for a damping ratio of 0.5 is
a) 1 b) 16 c) 32 d) 64

6) If for control system, the Laplace transform of error e(t) is given as $\frac{8(s+3)}{s(s+10)}$, then the steady state error would be
a) 3.6 b) 1.8 c) 3.2 d) 2.4

P.T.O.

7) The characteristic equation of the following closed-loop system is



a) $s^2 + 11s + 10 = 0$ b) $s^2 + 11s + 130 = 0$
c) $s^2 + 10s + 120 = 0$ d) $s^2 + 10s + 12 = 0$

8) In root locus the system having transfer function $G(s) = \frac{K}{s(s+1)(s+2)(s+3)}$, the number of asymptotates are _____
a) 1 b) 2 c) 3 d) 4

9) Time required for the response to reach 50% of steady state value for Ist time is called _____
a) risetime b) satelling time c) peak time d) delay time

10) The band width in frequency domain analysis of II order system is given by

a) $\omega_b = \omega_n\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]$

b) $\omega_b = \omega_n\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]^{1/2}$

c) $\omega_b = \omega_n^{\,2}\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]^{1/2}$

d) $\omega_b = \sqrt{\omega_n}\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]^{1/2}$

11) Rise time for IInd order system is _____

a) $\frac{\pi-\varphi}{\omega_d}$ b) $\frac{\omega_d}{\pi-\varphi}$ c) $\frac{\omega_n}{\pi-\varphi}$ d) $\frac{\pi-\phi}{\omega_n}$

12) Using lag compensator the system becomes _____
a) More sensitive b) More stable c) Faster d) More bandwidth

13) In Bode plot, If $\omega_{gc} < \omega_{pc}$ then the system is _____
a) stable b) unstable
c) marginally stable d) can't say

14) When damping factor $\delta = 1$, the system is _____
a) over damped b) critically damped
c) under damped d) none of these

Set P

_____

SLR-VB – 169

Seat No.	

S.E. (E&TC) (Part – II) (CGPA) Examination, 2017
CONTROL SYSTEM

Day and Date : Saturday, 20-5-2017 Marks : 56
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.*

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) State and explain Mason's gain formula.

b) Define :

i) Stability

ii) Absolute stability

iii) Relative stability

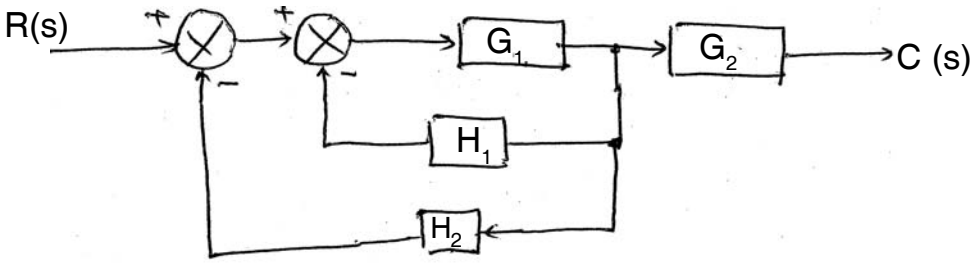
iv) Conditional stability.

c) Explain with neat diagram aircraft landing system.

d) Explain the working principle of stepper Motor.

e) Explain different types of control systems.

3. a) Find C(s)/R(s) of the block diagram shown below : **6**



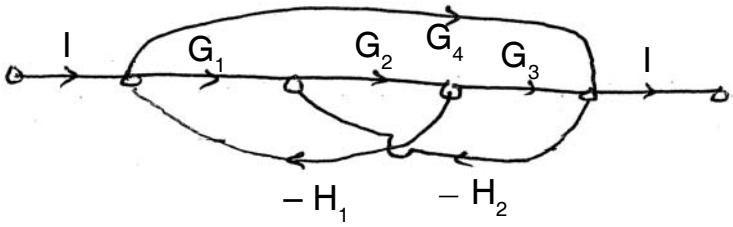
b) Solve **any one** : **6**

i) The open loop transfer function of a feedback control system is given by

$$G(s)\,H(s) = \frac{K}{s(s+4)\,(s^2+2s+2)}$$

Find the range of the values of K for stable system.

ii) Find the transfer function of the following signal flow graph using Mason's gain formula.



SECTION – II

4. Solve **any four** : **(4×4=16)**

a) Define the terms :

I) Gain Margin II) Phase margin

III) Transient response IV) Steady state response

b) Write a detail note on time domain analysis and frequency domain analysis and co-relation between them.

c) Determine position, velocity and acceleration constant for unity feedback control system whose open loop transfer function is $G(s) = \frac{50}{(1+0.15s)(1+2s)}$.

d) What are type of a system ? Explain type '0', type '1' system.

e) Explain how centroid and breakaway points are calculated in root locus.

5. Solve **any two** : **(6×2=12)**

a) Sketch the root locus for $G(s) = \frac{K}{(s+3)(s+4)}$.

b) What is Bodeplot ? Explain the steps to sketch Bode plot.

c) Write a detail note on compensator, its need and types of compensator.

SLR-VB – 169

Seat No.	

Set Q

S.E. (E&TC) (Part – II) (CGPA) Examination, 2017
CONTROL SYSTEM

Day and Date : Saturday, 20-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

***Instructions** : 1) **Assum**e 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 answer :

1) In root locus the system having transfer function $G(s) = \dfrac{K}{s(s+1)(s+2)(s+3)}$, the number of asymptotates are _____
a) 1 b) 2 c) 3 d) 4

2) Time required for the response to reach 50% of steady state value for Ist time is called _____
a) risetime b) satelling time c) peak time d) delay time

3) The band width in frequency domain analysis of II order system is given by

a) $\omega_b = \omega_n\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]$

b) $\omega_b = \omega_n\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]^{1/2}$

c) $\omega_b = \omega_n^{\,2}\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]^{1/2}$

d) $\omega_b = \sqrt{\omega_n}\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]^{1/2}$

4) Rise time for IInd order system is _____

a) $\dfrac{\pi-\varphi}{\omega_d}$ b) $\dfrac{\omega_d}{\pi-\varphi}$ c) $\dfrac{\omega_n}{\pi-\varphi}$ d) $\dfrac{\pi-\phi}{\omega_n}$

P.T.O.

5) Using lag compensator the system becomes _____
   a) More sensitive b) More stable c) Faster d) More bandwidth

6) In Bode plot, If $\omega_{gc} < \omega_{pc}$ then the system is _____
   a) stable b) unstable
   c) marginally stable d) can't say

7) When damping factor $\delta = 1$, the system is _____
   a) over damped b) critically damped
   c) under damped d) none of these

8) In force-voltage analogy, velocity is analogous to
   a) current b) charge c) inductance d) capacitance

9) Type 2 system has _____ at the origin.
   a) No pole b) No zero c) Simple pole d) two poles

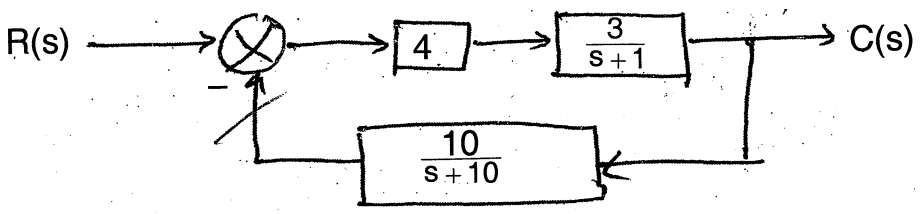
10) The impulse response of a LTI system is a unit step function, then the corresponding transfer function is
   a) $\frac{1}{s}$ b) $\frac{1}{s^2}$ c) 1 d) s

11) The equation $s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$ has _____ roots in the right half of s-plane.
   a) one b) zero c) two d) three

12) Given a unity feedback control system with $G(s) = \frac{K}{s(s+4)}$, the value of K for a damping ratio of 0.5 is
   a) 1 b) 16 c) 32 d) 64

13) If for control system, the Laplace transform of error e(t) is given as $\frac{8(s+3)}{s(s+10)}$, then the steady state error would be
   a) 3.6 b) 1.8 c) 3.2 d) 2.4

14) The characteristic equation of the following closed-loop system is



   a) $s^2 + 11s + 10 = 0$ b) $s^2 + 11s + 130 = 0$
   c) $s^2 + 10s + 120 = 0$ d) $s^2 + 10s + 12 = 0$

SLR-VB – 169

Seat No.	

S.E. (E&TC) (Part – II) (CGPA) Examination, 2017
CONTROL SYSTEM

Day and Date : Saturday, 20-5-2017 Marks : 56
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.*

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) State and explain Mason's gain formula.

b) Define :

i) Stability

ii) Absolute stability

iii) Relative stability

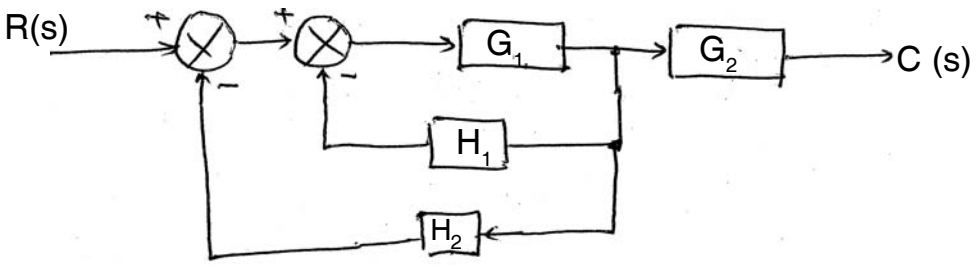
iv) Conditional stability.

c) Explain with neat diagram aircraft landing system.

d) Explain the working principle of stepper Motor.

e) Explain different types of control systems.

3. a) Find C(s)/R(s) of the block diagram shown below : **6**



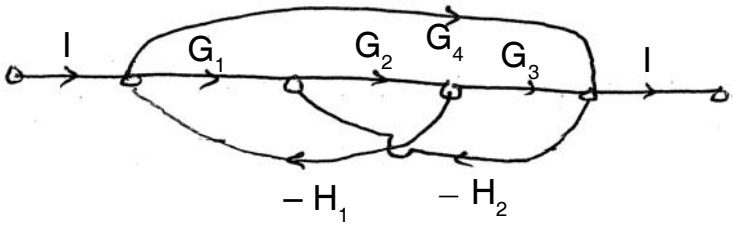
b) Solve **any one** : **6**

i) The open loop transfer function of a feedback control system is given by

$$G(s)\,H(s) = \frac{K}{s(s+4)\,(s^2+2s+2)}$$

Find the range of the values of K for stable system.

ii) Find the transfer function of the following signal flow graph using Mason's gain formula.



SECTION – II

4. Solve **any four** : **(4×4=16)**

a) Define the terms :

I) Gain Margin II) Phase margin

III) Transient response IV) Steady state response

b) Write a detail note on time domain analysis and frequency domain analysis and co-relation between them.

c) Determine position, velocity and acceleration constant for unity feedback control system whose open loop transfer function is $G(s) = \frac{50}{(1+0.15s)(1+2s)}$.

d) What are type of a system ? Explain type '0', type '1' system.

e) Explain how centroid and breakaway points are calculated in root locus.

5. Solve **any two** : **(6×2=12)**

a) Sketch the root locus for $G(s) = \frac{K}{(s+3)(s+4)}$.

b) What is Bodeplot ? Explain the steps to sketch Bode plot.

c) Write a detail note on compensator, its need and types of compensator.

SLR-VB – 169

Seat No.	

Set R

S.E. (E&TC) (Part – II) (CGPA) Examination, 2017
CONTROL SYSTEM

Day and Date : Saturday, 20-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

***Instructions** : 1) **Assum**e 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

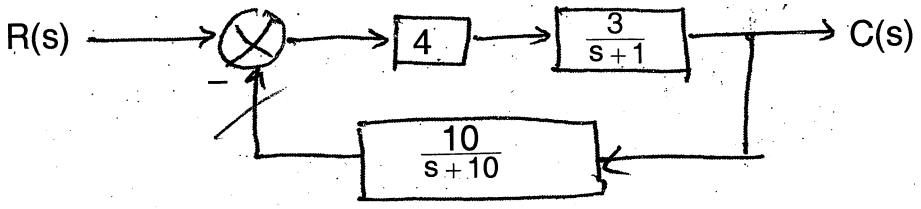
Duration : 30 Minutes Marks : 14

1. Choose the correct answer :

1) Given a unity feedback control system with $G(s) = \frac{K}{s(s+4)}$, the value of K for a damping ratio of 0.5 is
a) 1 b) 16 c) 32 d) 64

2) If for control system, the Laplace transform of error e(t) is given as $\frac{8(s+3)}{s(s+10)}$, then the steady state error would be
a) 3.6 b) 1.8 c) 3.2 d) 2.4

3) The characteristic equation of the following closed-loop system is



a) $s^2 + 11s + 10 = 0$ b) $s^2 + 11s + 130 = 0$
c) $s^2 + 10s + 120 = 0$ d) $s^2 + 10s + 12 = 0$

4) In root locus the system having transfer function $G(s) = \frac{K}{s(s+1)(s+2)(s+3)}$, the number of asymptotates are _____
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P.T.O.

5) Time required for the response to reach 50% of steady state value for Ist time is called _____
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6) The band width in frequency domain analysis of II order system is given by
   a) $\omega_b = \omega_n\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]$
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7) Rise time for IInd order system is _____
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8) Using lag compensator the system becomes _____
   a) More sensitive b) More stable c) Faster d) More bandwidth

9) In Bode plot, If $\omega_{gc} < \omega_{pc}$ then the system is _____
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10) When damping factor $\delta = 1$, the system is _____
   a) over damped b) critically damped
   c) under damped d) none of these

11) In force-voltage analogy, velocity is analogous to
   a) current b) charge c) inductance d) capacitance

12) Type 2 system has _____ at the origin.
   a) No pole b) No zero c) Simple pole d) two poles

13) The impulse response of a LTI system is a unit step function, then the corresponding transfer function is
   a) $\frac{1}{s}$ b) $\frac{1}{s^2}$ c) 1 d) s

14) The equation $s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$ has _____ roots in the right half of s-plane.
   a) one b) zero c) two d) three

_____

SLR-VB – 169

Seat No.	

S.E. (E&TC) (Part – II) (CGPA) Examination, 2017
CONTROL SYSTEM

Day and Date : Saturday, 20-5-2017 Marks : 56
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.*

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) State and explain Mason's gain formula.

b) Define :

i) Stability

ii) Absolute stability

iii) Relative stability

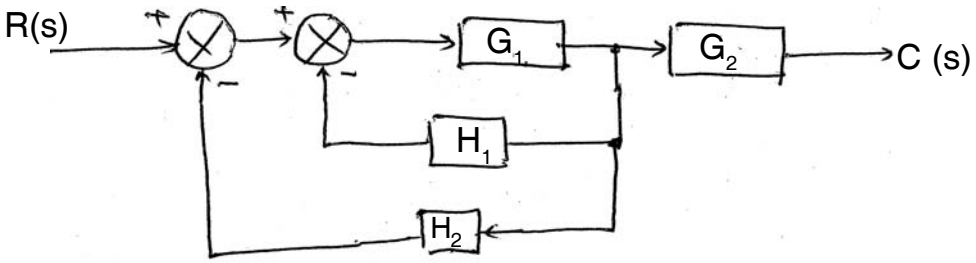
iv) Conditional stability.

c) Explain with neat diagram aircraft landing system.

d) Explain the working principle of stepper Motor.

e) Explain different types of control systems.

3. a) Find C(s)/R(s) of the block diagram shown below : **6**



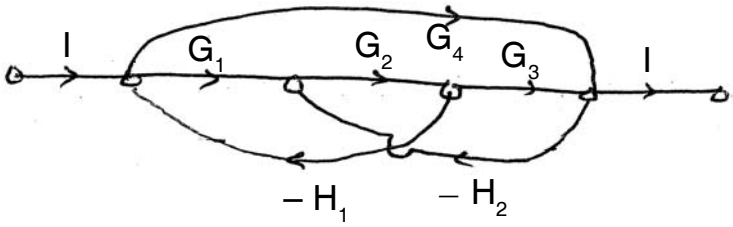
b) Solve **any one** : **6**

i) The open loop transfer function of a feedback control system is given by

$$G(s)\,H(s) = \frac{K}{s(s+4)\,(s^2+2s+2)}$$

Find the range of the values of K for stable system.

ii) Find the transfer function of the following signal flow graph using Mason's gain formula.



SECTION – II

4. Solve **any four** : **(4×4=16)**

a) Define the terms :

I) Gain Margin II) Phase margin

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b) Write a detail note on time domain analysis and frequency domain analysis and co-relation between them.

c) Determine position, velocity and acceleration constant for unity feedback control system whose open loop transfer function is $G(s) = \frac{50}{(1+0.15s)(1+2s)}$.

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e) Explain how centroid and breakaway points are calculated in root locus.

5. Solve **any two** : **(6×2=12)**

a) Sketch the root locus for $G(s) = \frac{K}{(s+3)(s+4)}$.

b) What is Bodeplot ? Explain the steps to sketch Bode plot.

c) Write a detail note on compensator, its need and types of compensator.

SLR-VB – 169

Seat No.	

Set S

S.E. (E&TC) (Part – II) (CGPA) Examination, 2017
CONTROL SYSTEM

Day and Date : Saturday, 20-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

***Instructions** : 1) **Assum**e 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 answer :

1) The band width in frequency domain analysis of II order system is given by

a) $\omega_b = \omega_n\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]$

b) $\omega_b = \omega_n\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]^{1/2}$

c) $\omega_b = \omega_n^{\,2}\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]^{1/2}$

d) $\omega_b = \sqrt{\omega_n}\left[1-2\delta^2+\sqrt{2-4\delta^2+4\delta^4}\right]^{1/2}$

2) Rise time for IInd order system is _____

a) $\frac{\pi-\varphi}{\omega_d}$ b) $\frac{\omega_d}{\pi-\varphi}$ c) $\frac{\omega_n}{\pi-\varphi}$ d) $\frac{\pi-\phi}{\omega_n}$

3) Using lag compensator the system becomes _____
a) More sensitive b) More stable c) Faster d) More bandwidth

4) In Bode plot, If $\omega_{gc} < \omega_{pc}$ then the system is _____
a) stable b) unstable
c) marginally stable d) can't say

5) When damping factor $\delta = 1$, the system is _____
a) over damped b) critically damped
c) under damped d) none of these

P.T.O.

6) In force-voltage analogy, velocity is analogous to
   a) current b) charge c) inductance d) capacitance

7) Type 2 system has _____ at the origin.
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8) The impulse response of a LTI system is a unit step function, then the corresponding transfer function is
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10) Given a unity feedback control system with $G(s) = \frac{K}{s(s+4)}$, the value of K for a damping ratio of 0.5 is
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11) If for control system, the Laplace transform of error e(t) is given as $\frac{8(s+3)}{s(s+10)}$, then the steady state error would be
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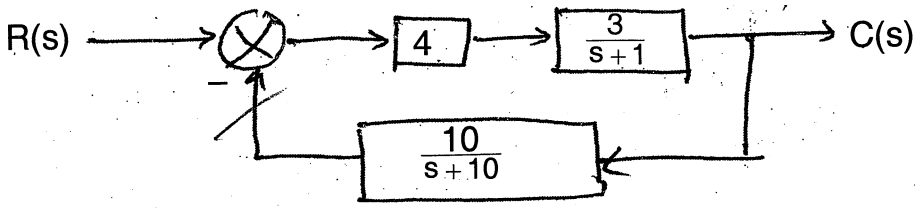
12) The characteristic equation of the following closed-loop system is



   a) $s^2 + 11s + 10 = 0$ b) $s^2 + 11s + 130 = 0$
   c) $s^2 + 10s + 120 = 0$ d) $s^2 + 10s + 12 = 0$

13) In root locus the system having transfer function $G(s) = \frac{K}{s(s+1)(s+2)(s+3)}$, the number of asymptotates are _____
   a) 1 b) 2 c) 3 d) 4

14) Time required for the response to reach 50% of steady state value for Ist time is called _____
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_____

SLR-VB – 169

Seat No.	

S.E. (E&TC) (Part – II) (CGPA) Examination, 2017
CONTROL SYSTEM

Day and Date : Saturday, 20-5-2017 Marks : 56
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.*

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) State and explain Mason's gain formula.

b) Define :

i) Stability

ii) Absolute stability

iii) Relative stability

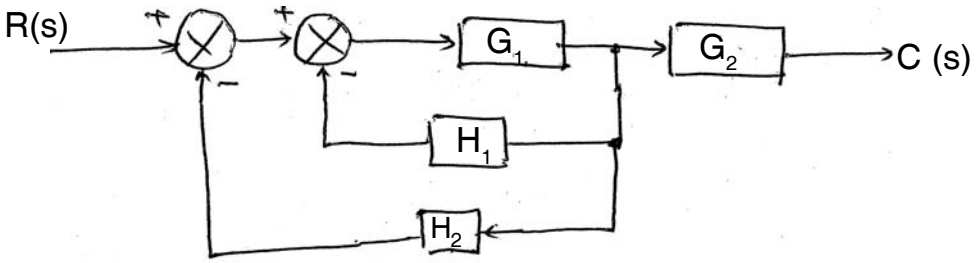
iv) Conditional stability.

c) Explain with neat diagram aircraft landing system.

d) Explain the working principle of stepper Motor.

e) Explain different types of control systems.

3. a) Find C(s)/R(s) of the block diagram shown below : **6**



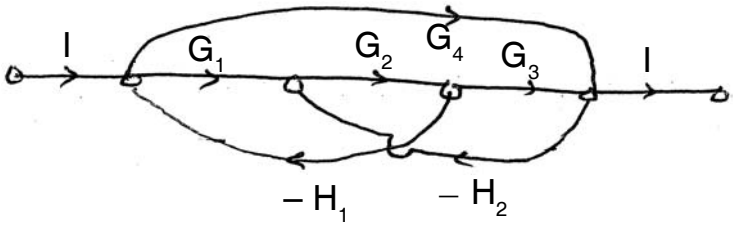
b) Solve **any one** : **6**

i) The open loop transfer function of a feedback control system is given by

$$G(s)\,H(s) = \frac{K}{s(s+4)\,(s^2+2s+2)}$$

Find the range of the values of K for stable system.

ii) Find the transfer function of the following signal flow graph using Mason's gain formula.



SECTION – II

4. Solve **any four** : **(4×4=16)**

a) Define the terms :

I) Gain Margin II) Phase margin

III) Transient response IV) Steady state response

b) Write a detail note on time domain analysis and frequency domain analysis and co-relation between them.

c) Determine position, velocity and acceleration constant for unity feedback control system whose open loop transfer function is $G(s) = \frac{50}{(1+0.15s)(1+2s)}$.

d) What are type of a system ? Explain type '0', type '1' system.

e) Explain how centroid and breakaway points are calculated in root locus.

5. Solve **any two** : **(6×2=12)**

a) Sketch the root locus for $G(s) = \frac{K}{(s+3)(s+4)}$.

b) What is Bodeplot ? Explain the steps to sketch Bode plot.

c) Write a detail note on compensator, its need and types of compensator.

SLR-VB – 170

Seat No.	

Set **P**

S.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Tuesday, 23-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 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

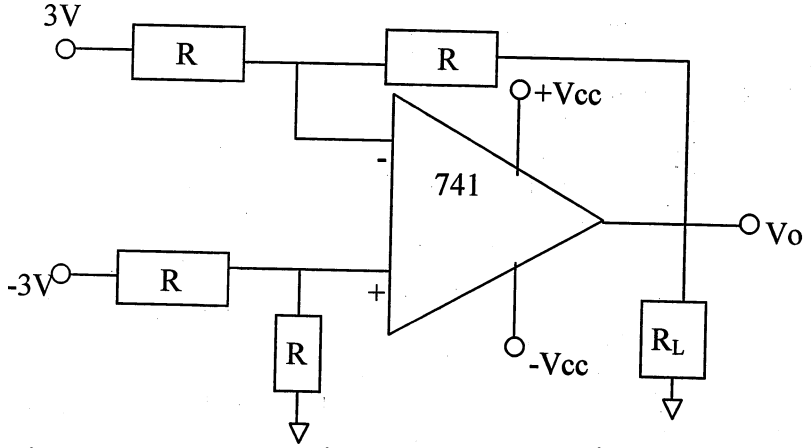
Duration : 30 Minutes Marks : 14

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

1) $A = Vo/V_{id}$ represents
   a) Closed loop gain b) Open loop gain
   c) CMRR d) None

2) For summing amplifier ratio of R_f/R should be
   a) Less than one b) Greater than one
   c) Zero d) One

3) For the following circuit what is the output voltage



a) 6 V b) 1 V c) 0 V d) – 6 V

4) Power consumption of typical op-amp is
   a) 800 mW b) 8 mW
   c) 85 mW d) 8 W

5) Output stage of op-amp is
   a) Increases output voltage swing b) Increases voltage gain
   c) Increases dc potential d) None

6) Output offset voltage caused by I_B is function of
   a) R_1 b) R_f c) R_i d) R_o

7) The gain of the basic differentiator increases with increase in frequency
   a) True b) False

8) VCO is
   a) Voltage Compensated Oscillator b) Voltage Controlled Offset
   c) Voltage to Current Convertor d) Voltage to Frequency Convertor

9) Zero Crossing Detector is special case of
   a) Basic comparator b) Peak detector
   c) Schmitt trigger d) Window detector

10) A square wave generator is also called as
   a) Astable multivibrator b) Bistable multivibrator
   c) Monostable multivibrator d) None of these

11) In phase shift oscillator the gain A_v must be at least
   a) 1 b) 3 c) 19 d) 29

12) The frequency of oscillation of phase shift oscillator f_0 =
   a) 0.159/(RC) b) $1/(2\pi RC)$ c) 1/(2RC) d) 0.065/(RC)

13) The application of 565 PLL are
   a) Frequency multiplier b) FSK demodulator
   c) Both a) and b) d) None of these

14) The ability of oscillator circuit to oscillate at one exact frequency is called as
   a) Frequency response b) Frequency stability
   c) Frequency drift d) Frequency linearity

———————

SLR-VB – 170

Seat No.	

S.E. (Electronics and Telecommunication Engineering) (Part – II)
(CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Tuesday, 23-5-2017 Max. Marks : 56

Time : 10.00 a.m. to 1.00 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) Derive slew rate equation.

b) Prove that for a inverting amplifier with feedback, $A_f = – k/B$.

c) For an AC inverting amplifier, derive equation for lower cut-off frequency.

d) Explain V to I converter with grounded load.

e) State any four specifications of IC 741.

3. Solve **any two** : **(6×2=12)**

a) Derive the voltage gain equation of DIBO differential amplifier.

b) Explain basic differentiator with circuit diagram, waveform and derive equation for output voltage.

c) Discuss advantages of voltage series feedback amplifier.

SECTION – II

4. Attempt **any four** of the following : **(4 marks each)**

   a) Draw pin diagram of IC 565 PLL.

   b) Explain multiplier circuit.

   c) Explain op-amp as basic comparator.

   d) List advantages of active filter.

   e) Explain log amplifier.

5. Attempt **any two** of the following : **(6 marks each)**

   a) Draw and explain quadrature oscillator.

   b) Explain sample and hold circuit in detail.

   c) Explain full wave precision rectifier.

SLR-VB – 170

Seat No.	

Set Q

S.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Tuesday, 23-5-2017 Max. Marks : 70

Time : 10.00 a.m. to 1.00 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 option : **(14×1=14)**

1) VCO is
   a) Voltage Compensated Oscillator b) Voltage Controlled Offset
   c) Voltage to Current Convertor d) Voltage to Frequency Convertor

2) Zero Crossing Detector is special case of
   a) Basic comparator b) Peak detector
   c) Schmitt trigger d) Window detector

3) A square wave generator is also called as
   a) Astable multivibrator b) Bistable multivibrator
   c) Monostable multivibrator d) None of these

4) In phase shift oscillator the gain A_v must be at least
   a) 1 b) 3 c) 19 d) 29

5) The frequency of oscillation of phase shift oscillator f_0 =
   a) 0.159/(RC) b) $1/(2\pi RC)$ c) 1/(2RC) d) 0.065/(RC)

P.T.O.

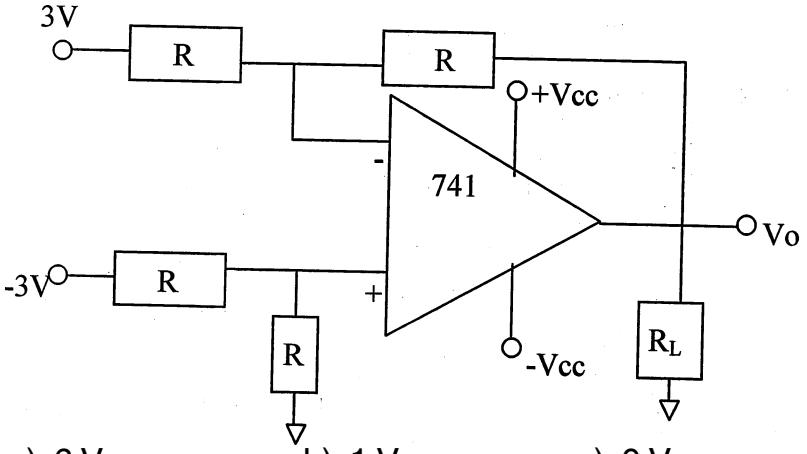
6) The application of 565 PLL are
   a) Frequency multiplier
   b) FSK demodulator
   c) Both a) and b)
   d) None of these

7) The ability of oscillator circuit to oscillate at one exact frequency is called as
   a) Frequency response
   b) Frequency stability
   c) Frequency drift
   d) Frequency linearity

8) $A = Vo/V_{id}$ represents
   a) Closed loop gain
   b) Open loop gain
   c) CMRR
   d) None

9) For summing amplifier ratio of R_f/R should be
   a) Less than one
   b) Greater than one
   c) Zero
   d) One

10) For the following circuit what is the output voltage



   a) 6 V
   b) 1 V
   c) 0 V
   d) – 6 V

11) Power consumption of typical op-amp is
   a) 800 mW
   b) 8 mW
   c) 85 mW
   d) 8 W

12) Output stage of op-amp is
   a) Increases output voltage swing
   b) Increases voltage gain
   c) Increases dc potential
   d) None

13) Output offset voltage caused by I_B is function of
   a) R_1
   b) R_f
   c) R_i
   d) R_o

14) The gain of the basic differentiator increases with increase in frequency
   a) True
   b) False

SLR-VB – 170

Seat No.	

S.E. (Electronics and Telecommunication Engineering) (Part – II)
(CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Tuesday, 23-5-2017 Max. Marks : 56

Time : 10.00 a.m. to 1.00 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) Derive slew rate equation.

b) Prove that for a inverting amplifier with feedback, $A_f = – k/B$.

c) For an AC inverting amplifier, derive equation for lower cut-off frequency.

d) Explain V to I converter with grounded load.

e) State any four specifications of IC 741.

3. Solve **any two** : **(6×2=12)**

a) Derive the voltage gain equation of DIBO differential amplifier.

b) Explain basic differentiator with circuit diagram, waveform and derive equation for output voltage.

c) Discuss advantages of voltage series feedback amplifier.

SECTION – II

4. Attempt **any four** of the following : **(4 marks each)**

   a) Draw pin diagram of IC 565 PLL.

   b) Explain multiplier circuit.

   c) Explain op-amp as basic comparator.

   d) List advantages of active filter.

   e) Explain log amplifier.

5. Attempt **any two** of the following : **(6 marks each)**

   a) Draw and explain quadrature oscillator.

   b) Explain sample and hold circuit in detail.

   c) Explain full wave precision rectifier.

SLR-VB – 170

Seat No.	

Set R

S.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Tuesday, 23-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 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 option : **(14×1=14)**

1) Output stage of op-amp is
   a) Increases output voltage swing b) Increases voltage gain
   c) Increases dc potential d) None

2) Output offset voltage caused by I_B is function of
   a) R_1 b) R_f c) R_i d) R_o

3) The gain of the basic differentiator increases with increase in frequency
   a) True b) False

4) VCO is
   a) Voltage Compensated Oscillator b) Voltage Controlled Offset
   c) Voltage to Current Convertor d) Voltage to Frequency Convertor

5) Zero Crossing Detector is special case of
   a) Basic comparator b) Peak detector
   c) Schmitt trigger d) Window detector

P.T.O.

6) A square wave generator is also called as
   a) Astable multivibrator b) Bistable multivibrator
   c) Monostable multivibrator d) None of these

7) In phase shift oscillator the gain A_v must be at least
   a) 1 b) 3 c) 19 d) 29

8) The frequency of oscillation of phase shift oscillator f_0 =
   a) 0.159/(RC) b) $1/(2\pi RC)$ c) 1/(2RC) d) 0.065/(RC)

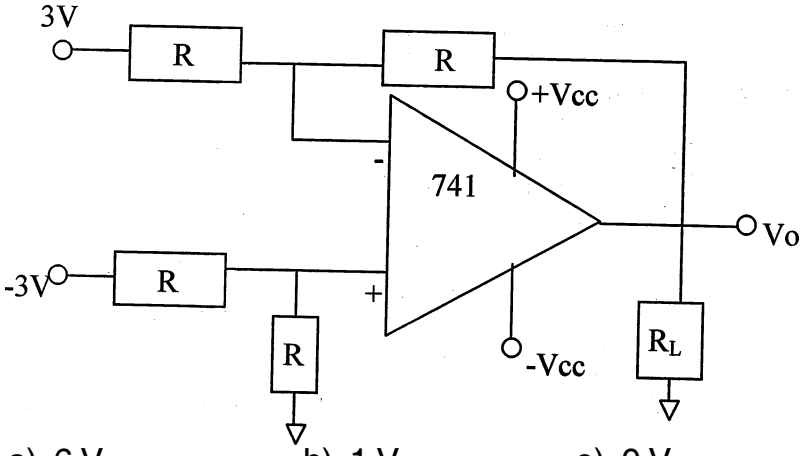
9) The application of 565 PLL are
   a) Frequency multiplier b) FSK demodulator
   c) Both a) and b) d) None of these

10) The ability of oscillator circuit to oscillate at one exact frequency is called as
   a) Frequency response b) Frequency stability
   c) Frequency drift d) Frequency linearity

11) $A = Vo/V_{id}$ represents
   a) Closed loop gain b) Open loop gain
   c) CMRR d) None

12) For summing amplifier ratio of R_f/R should be
   a) Less than one b) Greater than one
   c) Zero d) One

13) For the following circuit what is the output voltage



   a) 6 V b) 1 V c) 0 V d) – 6 V

14) Power consumption of typical op-amp is
   a) 800 mW b) 8 mW
   c) 85 mW d) 8 W

SLR-VB – 170

Seat No.	

S.E. (Electronics and Telecommunication Engineering) (Part – II)
(CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Tuesday, 23-5-2017 Max. Marks : 56

Time : 10.00 a.m. to 1.00 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) Derive slew rate equation.

b) Prove that for a inverting amplifier with feedback, $A_f = – k/B$.

c) For an AC inverting amplifier, derive equation for lower cut-off frequency.

d) Explain V to I converter with grounded load.

e) State any four specifications of IC 741.

3. Solve **any two** : **(6×2=12)**

a) Derive the voltage gain equation of DIBO differential amplifier.

b) Explain basic differentiator with circuit diagram, waveform and derive equation for output voltage.

c) Discuss advantages of voltage series feedback amplifier.

SECTION – II

4. Attempt **any four** of the following : **(4 marks each)**

   a) Draw pin diagram of IC 565 PLL.

   b) Explain multiplier circuit.

   c) Explain op-amp as basic comparator.

   d) List advantages of active filter.

   e) Explain log amplifier.

5. Attempt **any two** of the following : **(6 marks each)**

   a) Draw and explain quadrature oscillator.

   b) Explain sample and hold circuit in detail.

   c) Explain full wave precision rectifier.

SLR-VB – 170

Seat No.	

Set S

S.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Tuesday, 23-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 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 option : **(14×1=14)**

1) A square wave generator is also called as
   a) Astable multivibrator b) Bistable multivibrator
   c) Monostable multivibrator d) None of these

2) In phase shift oscillator the gain A_v must be at least
   a) 1 b) 3 c) 19 d) 29

3) The frequency of oscillation of phase shift oscillator f_0 =
   a) 0.159/(RC) b) $1/(2\pi RC)$ c) 1/(2RC) d) 0.065/(RC)

4) The application of 565 PLL are
   a) Frequency multiplier b) FSK demodulator
   c) Both a) and b) d) None of these

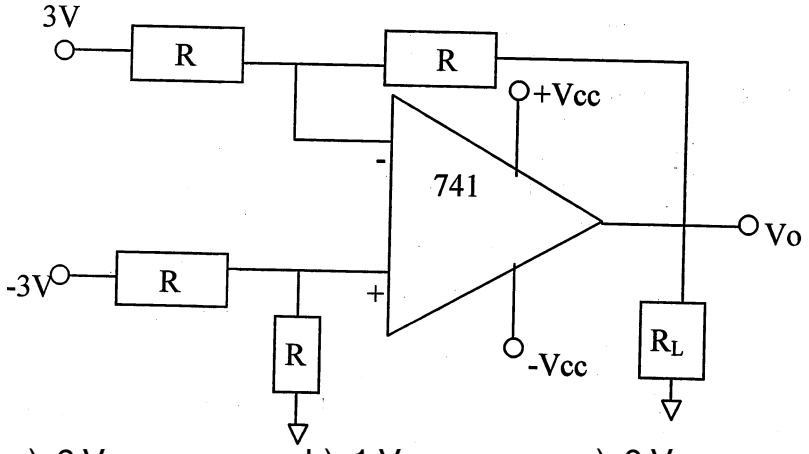
5) The ability of oscillator circuit to oscillate at one exact frequency is called as
   a) Frequency response b) Frequency stability
   c) Frequency drift d) Frequency linearity

6) $A = Vo/V_{id}$ represents
   a) Closed loop gain b) Open loop gain
   c) CMRR d) None

P.T.O.

7) For summing amplifier ratio of R_f/R should be
   a) Less than one b) Greater than one
   c) Zero d) One

8) For the following circuit what is the output voltage



   a) 6 V b) 1 V c) 0 V d) – 6 V

9) Power consumption of typical op-amp is
   a) 800 mW b) 8 mW
   c) 85 mW d) 8 W

10) Output stage of op-amp is
   a) Increases output voltage swing b) Increases voltage gain
   c) Increases dc potential d) None

11) Output offset voltage caused by I_B is function of
   a) R_1 b) R_f c) R_i d) R_o

12) The gain of the basic differentiator increases with increase in frequency
   a) True b) False

13) VCO is
   a) Voltage Compensated Oscillator b) Voltage Controlled Offset
   c) Voltage to Current Convertor d) Voltage to Frequency Convertor

14) Zero Crossing Detector is special case of
   a) Basic comparator b) Peak detector
   c) Schmitt trigger d) Window detector

SLR-VB – 170

Seat No.	

S.E. (Electronics and Telecommunication Engineering) (Part – II)
(CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Tuesday, 23-5-2017 Max. Marks : 56

Time : 10.00 a.m. to 1.00 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) Derive slew rate equation.

b) Prove that for a inverting amplifier with feedback, $A_f = – k/B$.

c) For an AC inverting amplifier, derive equation for lower cut-off frequency.

d) Explain V to I converter with grounded load.

e) State any four specifications of IC 741.

3. Solve **any two** : **(6×2=12)**

a) Derive the voltage gain equation of DIBO differential amplifier.

b) Explain basic differentiator with circuit diagram, waveform and derive equation for output voltage.

c) Discuss advantages of voltage series feedback amplifier.

SECTION – II

4. Attempt **any four** of the following : **(4 marks each)**

   a) Draw pin diagram of IC 565 PLL.

   b) Explain multiplier circuit.

   c) Explain op-amp as basic comparator.

   d) List advantages of active filter.

   e) Explain log amplifier.

5. Attempt **any two** of the following : **(6 marks each)**

   a) Draw and explain quadrature oscillator.

   b) Explain sample and hold circuit in detail.

   c) Explain full wave precision rectifier.

SLR-VB – 171

Seat No.	

Set P

S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
SIGNALS AND SYSTEMS

Day and Date : Thursday, 25-5-2017 Max. Marks : 70
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 : 14

1. Choose correct alternatives : **(14×1=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) Odd signal satisfies
   a) $x(-t) = x(t)$ b) $x[-n] = -x[n]$
   c) $x[n + 1] = ax[n] + b$ d) $\frac{dx(t)}{dt} = c$

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) The impulse response h [n] of the LTI system is

h [n] = u [n + 3] + u [n – 2] –2u [n – 7]

a) Stable but not causal
b) Stable and causal
c) Causal but unstable
d) Unstable and non-causal

6) Energy signals are the signals with

a) $0 < E < \infty$, $P = 0$
b) $0 < E < \infty$, $P = \infty$
c) $0 < P < \infty$, $P = \infty$
d) $0 < P < \infty$, $E = 0$

7) Convolution of x (t + 5) with impulse function δ (t – 7) is equal to

a) x (t – 12) b) x (t + 12) c) x (t – 2) d) x (t + 2)

8) If x (n) = u (n) – u (n – 3) then ROC is

a) Entire Z plane
b) Entire Z plane, except z = 0
c) Entire Z plane, except $z = \infty$
d) Entire Z plane, except z = 0 and $z = \infty$

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) A signal x (t) has a Fourier transform X (w). If x (t) is a real and odd function of t, then X (w) is

a) A real and even function of w
b) An imaginary and odd function of w
c) An imaginary and even function of w
d) A real and odd function of w

11) The Fourier transform of F (at) is given by

a) f (at) $\leftrightarrow$ a F (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 $n \leq 0$ then it is called as _____ sequence.

a) Bilateral b) Unilateral c) Both a) and b) d) None

_____

SLR-VB – 171

Seat No.	

S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
SIGNALS AND SYSTEMS

Day and Date : Thursday, 25-5-2017 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

2. Answer **any three** : **(3×4=12)**
   1) Sketch the following signal :
   $y(t) = r(t-1) + u(t)$.
   2) Find even and odd component of the following signal :
   $X(t) = \cos(t) + \sin(t) + \cos(t) \cdot \sin(t)$.
   3) Obtain direct form – I realization for the system described by differential equation $\frac{d^2y(t)}{dt^2} - \frac{dy(t)}{dt} - 2y(t) = x(t)$.
   4) Find the power of the signal $x(t) = 10 \cos 5t \cos 10t$.

3. Answer **any two** : **(2×8=16)**
   1) Find the step response and also check the stability if the impulse response is $(-a)^n u(n)$.
   2) Determine the following system is :
      a) Static/Dynamic
      b) Linear/Non-linear
      c) Causal/Non-causal
      d) Time variant/Invariant
      $y(t) = \text{even } x(t)$.
   3) Find the convolution and comment on causality
   $x(t) = e^{-at} u(t)$ $h(t) = e^{-bt} u(t)$

SECTION – II

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

   1) Explain discrete time processing of continuous time signals in detail.

   2) State and explain sampling theorem and Nyquist rate in detail.

   3) Find Z transform with its ROC for $(n) = 0.6^n \cdot u(n)$.

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

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. $X(z) = \frac{z^2 + z}{z^3 - z^2 + 3z - 1}$; Right sided sequence.

   3) Find Fourier series coefficient using trigonometric Fourier series method for the full wave rectified signal with fundamental frequency $w_0 = \pi$.

SLR-VB – 171

Seat No.	

Set Q

S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
SIGNALS AND SYSTEMS

Day and Date : Thursday, 25-5-2017 Max. Marks : 70
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 : 14

1. Choose correct alternatives : **(14×1=14)**

1) If x (n) = u (n) – u (n – 3) then ROC is
   a) Entire Z plane
   b) Entire Z plane, except z = 0
   c) Entire Z plane, except z = ∞
   d) Entire Z plane, except z = 0 and z = ∞

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) A signal x (t) has a Fourier transform X (w). If x (t) is a real and odd function of t, then X (w) is
   a) A real and even function of w
   b) An imaginary and odd function of w
   c) An imaginary and even function of w
   d) A real and odd function of w

4) The Fourier transform of F (at) is given by
   a) f (at) $\leftrightarrow$ a F (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 $n \leq 0$ 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) Odd signal satisfies
   a) $x(-t) = x(t)$ b) $x[-n] = -x[n]$
   c) $x[n + 1] = ax[n] + b$ d) $\frac{dx(t)}{dt} = c$

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) The impulse response h [n] of the LTI system is
   $h[n] = u[n + 3] + u[n - 2] - 2u[n - 7]$
   a) Stable but not causal b) Stable and causal
   c) Causal but unstable d) Unstable and non-causal

13) Energy signals are the signals with
   a) $0 < E < \infty$, $P = 0$ b) $0 < E < \infty$, $P = \infty$
   c) $0 < P < \infty$, $P = \infty$ d) $0 < P < \infty$, $E = 0$

14) Convolution of $x(t + 5)$ with impulse function $\delta(t - 7)$ is equal to
   a) $x(t - 12)$ b) $x(t + 12)$ c) $x(t - 2)$ d) $x(t + 2)$

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SLR-VB – 171

Seat No.	

S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
SIGNALS AND SYSTEMS

Day and Date : Thursday, 25-5-2017 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

2. Answer **any three** : **(3×4=12)**
   1) Sketch the following signal :
   $y(t) = r(t-1) + u(t)$.
   2) Find even and odd component of the following signal :
   $X(t) = \cos(t) + \sin(t) + \cos(t) \cdot \sin(t)$.
   3) Obtain direct form – I realization for the system described by differential equation $\frac{d^2y(t)}{dt^2} - \frac{dy(t)}{dt} - 2y(t) = x(t)$.
   4) Find the power of the signal $x(t) = 10 \cos 5t \cos 10t$.

3. Answer **any two** : **(2×8=16)**
   1) Find the step response and also check the stability if the impulse response is $(-a)^n u(n)$.
   2) Determine the following system is :
      a) Static/Dynamic
      b) Linear/Non-linear
      c) Causal/Non-causal
      d) Time variant/Invariant
      $y(t) = \text{even } x(t)$.
   3) Find the convolution and comment on causality
   $x(t) = e^{-at} u(t)$ $h(t) = e^{-bt} u(t)$

SECTION – II

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

   1) Explain discrete time processing of continuous time signals in detail.

   2) State and explain sampling theorem and Nyquist rate in detail.

   3) Find Z transform with its ROC for $(n) = 0.6^n \cdot u(n)$.

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

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. $X(z) = \frac{z^2 + z}{z^3 - z^2 + 3z - 1}$; Right sided sequence.

   3) Find Fourier series coefficient using trigonometric Fourier series method for the full wave rectified signal with fundamental frequency $w_0 = \pi$.

SLR-VB – 171

Seat No.	

Set R

S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
SIGNALS AND SYSTEMS

Day and Date : Thursday, 25-5-2017 Max. Marks : 70
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 : 14

1. Choose correct alternatives : **(14×1=14)**

1) The impulse response h [n] of the LTI system is

h [n] = u [n + 3] + u [n – 2] –2u [n – 7]

a) Stable but not causal b) Stable and causal
c) Causal but unstable d) Unstable and non-causal

2) Energy signals are the signals with

a) $0 < E < \infty$, $P = 0$ b) $0 < E < \infty$, $P = \infty$
c) $0 < P < \infty$, $P = \infty$ d) $0 < P < \infty$, $E = 0$

3) Convolution of x (t + 5) with impulse function δ (t – 7) is equal to

a) x (t – 12) b) x (t + 12) c) x (t – 2) d) x (t + 2)

4) If x (n) = u (n) – u (n – 3) then ROC is

a) Entire Z plane
b) Entire Z plane, except z = 0
c) Entire Z plane, except $z = \infty$
d) Entire Z plane, except z = 0 and $z = \infty$

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) A signal x (t) has a Fourier transform X (w). If x (t) is a real and odd function of t, then X (w) is
   a) A real and even function of w
   b) An imaginary and odd function of w
   c) An imaginary and even function of w
   d) A real and odd function of w

7) The Fourier transform of F (at) is given by
   a) f (at) $\leftrightarrow$ a F (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 n $\leq$ 0 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 2πt u (t)
   c) x (t) = sin $(2\pi/3)$ t
   d) x (t) = $\sin^2$ (t)

13) Odd signal satisfies
   a) x (–t) = x (t)
   b) x [–n] = –x [n]
   c) x [n + 1] = ax [n] + b
   d) $\frac{dx(t)}{dt} = c$

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

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SLR-VB – 171

Seat No.	

S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
SIGNALS AND SYSTEMS

Day and Date : Thursday, 25-5-2017 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

2. Answer **any three** : **(3×4=12)**
   1) Sketch the following signal :
   $y(t) = r(t-1) + u(t)$.
   2) Find even and odd component of the following signal :
   $X(t) = \cos(t) + \sin(t) + \cos(t) \cdot \sin(t)$.
   3) Obtain direct form – I realization for the system described by differential equation $\frac{d^2y(t)}{dt^2} - \frac{dy(t)}{dt} - 2y(t) = x(t)$.
   4) Find the power of the signal $x(t) = 10 \cos 5t \cos 10t$.

3. Answer **any two** : **(2×8=16)**
   1) Find the step response and also check the stability if the impulse response is $(-a)^n u(n)$.
   2) Determine the following system is :
      a) Static/Dynamic
      b) Linear/Non-linear
      c) Causal/Non-causal
      d) Time variant/Invariant
      $y(t) = \text{even } x(t)$.
   3) Find the convolution and comment on causality
   $x(t) = e^{-at} u(t)$ $h(t) = e^{-bt} u(t)$

SECTION – II

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

   1) Explain discrete time processing of continuous time signals in detail.

   2) State and explain sampling theorem and Nyquist rate in detail.

   3) Find Z transform with its ROC for $(n) = 0.6^n \cdot u(n)$.

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

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. $X(z) = \frac{z^2 + z}{z^3 - z^2 + 3z - 1}$; Right sided sequence.

   3) Find Fourier series coefficient using trigonometric Fourier series method for the full wave rectified signal with fundamental frequency $w_0 = \pi$.

SLR-VB – 171

Seat No.	

Set S

S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
SIGNALS AND SYSTEMS

Day and Date : Thursday, 25-5-2017 Max. Marks : 70
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 : 14

1. Choose correct alternatives : **(14×1=14)**

1) A signal x (t) has a Fourier transform X (w). If x (t) is a real and odd function of t, then X (w) is
   a) A real and even function of w
   b) An imaginary and odd function of w
   c) An imaginary and even function of w
   d) A real and odd function of w

2) The Fourier transform of F (at) is given by
   a) f (at) $\leftrightarrow$ a F (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 n $\leq$ 0 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) Odd signal satisfies
   a) $x(-t) = x(t)$ b) $x[-n] = -x[n]$
   c) $x[n + 1] = ax[n] + b$ d) $\frac{dx(t)}{dt} = c$

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) The impulse response h [n] of the LTI system is
   $h[n] = u[n + 3] + u[n - 2] - 2u[n - 7]$
   a) Stable but not causal b) Stable and causal
   c) Causal but unstable d) Unstable and non-causal

11) Energy signals are the signals with
   a) $0 < E < \infty$, $P = 0$ b) $0 < E < \infty$, $P = \infty$
   c) $0 < P < \infty$, $P = \infty$ d) $0 < P < \infty$, $E = 0$

12) Convolution of $x(t + 5)$ with impulse function $\delta(t - 7)$ is equal to
   a) $x(t - 12)$ b) $x(t + 12)$ c) $x(t - 2)$ d) $x(t + 2)$

13) If $x(n) = u(n) - u(n - 3)$ then ROC is
   a) Entire Z plane
   b) Entire Z plane, except $z = 0$
   c) Entire Z plane, except $z = \infty$
   d) Entire Z plane, except $z = 0$ and $z = \infty$

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

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SLR-VB – 171

Seat No.	

S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
SIGNALS AND SYSTEMS

Day and Date : Thursday, 25-5-2017 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

2. Answer **any three** : **(3×4=12)**
   1) Sketch the following signal :
   $y(t) = r(t-1) + u(t)$.
   2) Find even and odd component of the following signal :
   $X(t) = \cos(t) + \sin(t) + \cos(t) \cdot \sin(t)$.
   3) Obtain direct form – I realization for the system described by differential equation $\frac{d^2y(t)}{dt^2} - \frac{dy(t)}{dt} - 2y(t) = x(t)$.
   4) Find the power of the signal $x(t) = 10 \cos 5t \cos 10t$.

3. Answer **any two** : **(2×8=16)**
   1) Find the step response and also check the stability if the impulse response is $(-a)^n u(n)$.
   2) Determine the following system is :
      a) Static/Dynamic
      b) Linear/Non-linear
      c) Causal/Non-causal
      d) Time variant/Invariant
      $y(t) = \text{even } x(t)$.
   3) Find the convolution and comment on causality
   $x(t) = e^{-at} u(t)$ $h(t) = e^{-bt} u(t)$

SECTION – II

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

   1) Explain discrete time processing of continuous time signals in detail.

   2) State and explain sampling theorem and Nyquist rate in detail.

   3) Find Z transform with its ROC for $(n) = 0.6^n \cdot u(n)$.

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

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. $X(z) = \frac{z^2 + z}{z^3 - z^2 + 3z - 1}$; Right sided sequence.

   3) Find Fourier series coefficient using trigonometric Fourier series method for the full wave rectified signal with fundamental frequency $w_0 = \pi$.

SLR-VB – 172

Seat No.	

Set P

T.E. (Electronics & Telecommunication Engg.) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGG. & RADIATING SYSTEMS

Day and Date : Thursday, 4-5-2017 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**.*
*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 : **(1×14=14)**

1) Potential at all points on the surface of a conductor is
a) same b) infinity c) not same d) zero

2) The charge density of 10 nC/m^2 is distributed on a plane z = 5m, the electric field intensity at origin is
a) 180 πa_z b) –180 πa_z c) –10 πa_z d) – 360 πa_z

3) A point is obtained by intersection of _____ in spherical co-ordinates.
a) 3 planes b) 2 planes and circle
c) plane, circle and a cone d) none of these

4) If the force $\overline{E} = 2\overline{ax} - 2\overline{ay} + 2\overline{az}$ moves $2\mu C$ charge through a displacement of $4\overline{ax} + 4\overline{ay} - 4\overline{az}$ the resultant work done is
a) $-8\mu J$ b) $8\mu J$ c) $16\mu J$ d) $-16\mu J$

5) Potential due to charge at a point situated at ∞ is
a) ∞ b) zero c) finite d) 1

6) A thunder cloud above earth sets up a vertical electric field of 40 V/m. A rain drop carrying a charge of 0.1 micro C lines in this field. The electrostatic force exerted on this rain drop is _____ Newtons.
a) 40 b) 4×10^{-6} c) 4×10^{-9} d) 4

P.T.O.

7) If $\overline{E}$ is a vector then $\nabla \cdot \nabla \times \overline{E}$ is
   a) 1 b) 0 c) ∞ d) doesn't exist

8) The intensity of radiation of a Dipole Depends strongly on Antenna. If at a frequency f, the intensity of radiation is 'I'. Then at a frequency of f/2, the intensity will be
   a) I/2 b) I/4 c) I/8 d) I/6

9) A uniform plane wave is one in which
   a) E and H are perpendicular b) E and H lie in a plane
   c) $E \times H = 0$ d) $E \cdot H = 0$

10) A plane electromagnetic wave travels in dielectric medium of relative permittivity 9. Relative to free space, the velocity of propagation in the dielectric is
   a) increased by a factor of 9 b) increased by a factor of 3
   c) unchanged d) reduced by a factor of 1/3

11) The radiation resistance of a $\lambda/16$ wire dipole in free space will be nearly
   a) 1Ω b) 3Ω c) 13Ω d) 30Ω

12) The Dept. of Penetration of Wave in Lossy Delectric increases with increasing
   a) Permeability b) Permittivity
   c) Wavelength d) None of these

13) Unit of Scalar Magnetic Potential is
   a) Ampere b) wb c) wb/m d) H/m

14) The ratio $\sigma/\omega\varepsilon$ is called
   a) Intrinsic ratio b) Loss tangent
   c) Conduction ratio d) Dissipation factor

SLR-VB – 172

Seat No.	

T.E. (Electronics & Telecommunication Engg.) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGG. & RADIATING SYSTEMS

Day and Date : Thursday, 4-5-2017 Marks : 56
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.*

SECTION – I

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

1) State and prove Divergence Theorem.

2) Transform the vector $\overline{A} = 4\overline{a}_x - 2\overline{a}_y - 4\overline{a}_z$ at point B(x = –2, y = –3, z = 5) to spherical coordinates.

3) Prove that $\overline{E} = -\nabla V$.

4) Find the amount of energy stored if charge of 3 μC is placed at each corner of an equilateral triangle having side of 2m length.

5) Consider two concentric spheres having radius ‘a’ and ‘b’. Derive an equation for capacitance of spherical capacitor.

3. Attempt **any two**. **(2×8=16)**

a) Derive conductor free space boundary condition.

b) Calculate electric flux density at P(2, –3, 6) produced by a point charge of 55 μC at Q(–2, 3, 6) and a uniform line charge of 20 μC /m placed along x-axis.

c) Derive an expression for electric field intensity on z axis produced by an infinite uniform sheet charge placed in z = 0 plane.

SECTION – II

4. Solve **any three**. **(3×4=12)**

   1) Derive the relation between effective area and effective length.

   2) Explain Antenna field zones.

   3) Calculate the Intrinsic impedance η, propagation constant γ, wave velocity v for a conducting medium in which $\mu_r = 1, \varepsilon_r = 1, \sigma = 58$ Ms/m at frequency f = 100 MHz.

   4) A Square Loop of Length 'a' through which current of I amp is passes in clockwise direction. Find H at Centre of the Square Loop.

   5) Derive Expression For Magnetic Field Intensity on the Axis of a Circular Loop.

5. Solve **any two**. **(2×8=16)**

   1) Derive Maxwell equation for Harmonically time Varying Field. Explain word statement of Maxwell equation and physical significance of Displacement current.

   2) Evaluate both side of Stroke's Theorem for the field, $\overline{H} = 6xy\ \bar{a}_x - 3y^2\ \bar{a}_y A/m$ and the rectangular path bounded by the region $2 \leq x \leq 5$, $-1 \leq y \leq 1$, z = 0. Let positive direction of ds be a_z.

   3) Derive Relation for power radiated and radiation resistance of short dipole Antenna.

SLR-VB – 172

Seat No.	

Set Q

T.E. (Electronics & Telecommunication Engg.) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGG. & RADIATING SYSTEMS

Day and Date : Thursday, 4-5-2017 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**.*
*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 : **(1×14=14)**

1) The intensity of radiation of a Dipole Depends strongly on Antenna. If at a frequency f, the intensity of radiation is 'I'. Then at a frequency of f/2, the intensity will be
a) I/2 b) I/4 c) I/8 d) I/6

2) A uniform plane wave is one in which
a) E and H are perpendicular b) E and H lie in a plane
c) $E \times H = 0$ d) $E \cdot H = 0$

3) A plane electromagnetic wave travels in dielectric medium of relative permittivity 9. Relative to free space, the velocity of propagation in the dielectric is
a) increased by a factor of 9 b) increased by a factor of 3
c) unchanged d) reduced by a factor of 1/3

4) The radiation resistance of a $\lambda/16$ wire dipole in free space will be nearly
a) $1\,\Omega$ b) $3\,\Omega$ c) $13\,\Omega$ d) $30\,\Omega$

5) The Dept. of Penetration of Wave in Lossy Delectric increases with increasing
a) Permeability b) Permittivity
c) Wavelength d) None of these

6) Unit of Scalar Magnetic Potential is
a) Ampere b) wb c) wb/m d) H/m

P.T.O.

7) The ratio $\sigma / \omega\varepsilon$ is called
   a) Intrinsic ratio b) Loss tangent
   c) Conduction ratio d) Dissipation factor

8) Potential at all points on the surface of a conductor is
   a) same b) infinity c) not same d) zero

9) The charge density of 10 nC/m^2 is distributed on a plane z = 5m, the electric field intensity at origin is
   a) 180 πa_z b) –180 πa_z c) –10 πa_z d) – 360 πa_z

10) A point is obtained by intersection of _____ in spherical co-ordinates.
   a) 3 planes b) 2 planes and circle
   c) plane, circle and a cone d) none of these

11) If the force $\overline{E} = 2\overline{a}\overline{x} - 2\overline{a}\overline{y} + 2\overline{a}\overline{z}$ moves $2\mu C$ charge through a displacement of $4\overline{a}\overline{x} + 4\overline{a}\overline{y} - 4\overline{a}\overline{z}$ the resultant work done is
   a) $-8\mu J$ b) $8\mu J$ c) $16\mu J$ d) $-16\mu J$

12) Potential due to charge at a point situated at ∞ is
   a) ∞ b) zero c) finite d) 1

13) A thunder cloud above earth sets up a vertical electric field of 40 V/m. A rain drop carrying a charge of 0.1 micro C lines in this field. The electrostatic force exerted on this rain drop is _____ Newtons.
   a) 40 b) 4×10^{-6} c) 4×10^{-9} d) 4

14) If $\overline{E}$ is a vector then $\nabla \cdot \nabla \times \overline{E}$ is
   a) 1 b) 0 c) ∞ d) doesn't exist

_____

SLR-VB – 172

Seat No.	

T.E. (Electronics & Telecommunication Engg.) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGG. & RADIATING SYSTEMS

Day and Date : Thursday, 4-5-2017 Marks : 56
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.*

SECTION – I

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

1) State and prove Divergence Theorem.

2) Transform the vector $\overline{A} = 4\overline{a}x - 2\overline{a}y - 4\overline{a}z$ at point B(x = –2, y = –3, z = 5) to spherical coordinates.

3) Prove that $\overline{E} = -\nabla V$.

4) Find the amount of energy stored if charge of 3 μC is placed at each corner of an equilateral triangle having side of 2m length.

5) Consider two concentric spheres having radius ‘a’ and ‘b’. Derive an equation for capacitance of spherical capacitor.

3. Attempt **any two**. **(2×8=16)**

a) Derive conductor free space boundary condition.

b) Calculate electric flux density at P(2, –3, 6) produced by a point charge of 55 μC at Q(–2, 3, 6) and a uniform line charge of 20 μC /m placed along x-axis.

c) Derive an expression for electric field intensity on z axis produced by an infinite uniform sheet charge placed in z = 0 plane.

SECTION – II

4. Solve **any three**. **(3×4=12)**

   1) Derive the relation between effective area and effective length.

   2) Explain Antenna field zones.

   3) Calculate the Intrinsic impedance η, propagation constant γ, wave velocity v for a conducting medium in which $\mu_r = 1, \varepsilon_r = 1, \sigma = 58$ Ms/m at frequency f = 100 MHz.

   4) A Square Loop of Length 'a' through which current of I amp is passes in clockwise direction. Find H at Centre of the Square Loop.

   5) Derive Expression For Magnetic Field Intensity on the Axis of a Circular Loop.

5. Solve **any two**. **(2×8=16)**

   1) Derive Maxwell equation for Harmonically time Varying Field. Explain word statement of Maxwell equation and physical significance of Displacement current.

   2) Evaluate both side of Stroke's Theorem for the field, $\overline{H} = 6xy\ \bar{a}_x - 3y^2\ \bar{a}_y A/m$ and the rectangular path bounded by the region $2 \leq x \leq 5$, $-1 \leq y \leq 1$, z = 0. Let positive direction of ds be a_z.

   3) Derive Relation for power radiated and radiation resistance of short dipole Antenna.

SLR-VB – 172

Seat No.	

Set R

T.E. (Electronics & Telecommunication Engg.) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGG. & RADIATING SYSTEMS

Day and Date : Thursday, 4-5-2017 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**.*
*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 : **(1×14=14)**

1) Potential due to charge at a point situated at ∞ is
a) ∞ b) zero c) finite d) 1

2) A thunder cloud above earth sets up a vertical electric field of 40 V/m. A rain drop carrying a charge of 0.1 micro C lines in this field. The electrostatic force exerted on this rain drop is _____ Newtons.
a) 40 b) 4×10^{-6} c) 4×10^{-9} d) 4

3) If $\overline{E}$ is a vector then $\nabla \cdot \nabla \times \overline{E}$ is
a) 1 b) 0 c) ∞ d) doesn't exist

4) The intensity of radiation of a Dipole Depends strongly on Antenna. If at a frequency f, the intensity of radiation is 'I'. Then at a frequency of f/2, the intensity will be
a) I/2 b) I/4 c) I/8 d) I/6

5) A uniform plane wave is one in which
a) E and H are perpendicular b) E and H lie in a plane
c) $E \times H = 0$ d) $E \cdot H = 0$

6) A plane electromagnetic wave travels in dielectric medium of relative permittivity 9. Relative to free space, the velocity of propagation in the dielectric is
a) increased by a factor of 9 b) increased by a factor of 3
c) unchanged d) reduced by a factor of 1/3

P.T.O.

7) The radiation resistance of a $\lambda/16$ wire dipole in free space will be nearly
   a) 1Ω b) 3Ω c) 13Ω d) 30Ω

8) The Dept. of Penetration of Wave in Lossy Delectric increases with increasing
   a) Permeability b) Permittivity
   c) Wavelength d) None of these

9) Unit of Scalar Magnetic Potential is
   a) Ampere b) wb c) wb/m d) H/m

10) The ratio $\sigma/\omega\varepsilon$ is called
   a) Intrinsic ratio b) Loss tangent
   c) Conduction ratio d) Dissipation factor

11) Potential at all points on the surface of a conductor is
   a) same b) infinity c) not same d) zero

12) The charge density of 10 nC/m^2 is distributed on a plane z = 5m, the electric field intensity at origin is
   a) $180\ \pi a_z$ b) $-180\ \pi a_z$ c) $-10\ \pi a_z$ d) $-360\ \pi a_z$

13) A point is obtained by intersection of _____ in spherical co-ordinates.
   a) 3 planes b) 2 planes and circle
   c) plane, circle and a cone d) none of these

14) If the force $\overline{E} = 2\overline{ax} - 2\overline{ay} + 2\overline{az}$ moves $2\mu C$ charge through a displacement of $4\overline{ax} + 4\overline{ay} - 4\overline{az}$ the resultant work done is
   a) $-8\mu J$ b) $8\mu J$ c) $16\mu J$ d) $-16\mu J$

_____

SLR-VB – 172

Seat No.	

T.E. (Electronics & Telecommunication Engg.) (Part – I) (CGPA)
Examination, 2017
ELECTROMAGNETIC ENGG. & RADIATING SYSTEMS

Day and Date : Thursday, 4-5-2017 Marks : 56

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.*

SECTION – I

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

1) State and prove Divergence Theorem.

2) Transform the vector $\overline{A} = 4\overline{a}x - 2\overline{a}y - 4\overline{a}z$ at point B(x = –2, y = –3, z = 5) to spherical coordinates.

3) Prove that $\overline{E} = -\nabla V$.

4) Find the amount of energy stored if charge of 3 μC is placed at each corner of an equilateral triangle having side of 2m length.

5) Consider two concentric spheres having radius ‘a’ and ‘b’. Derive an equation for capacitance of spherical capacitor.

3. Attempt **any two**. **(2×8=16)**

a) Derive conductor free space boundary condition.

b) Calculate electric flux density at P(2, –3, 6) produced by a point charge of 55 μC at Q(–2, 3, 6) and a uniform line charge of 20 μC /m placed along x-axis.

c) Derive an expression for electric field intensity on z axis produced by an infinite uniform sheet charge placed in z = 0 plane.

SECTION – II

4. Solve **any three**. **(3×4=12)**

   1) Derive the relation between effective area and effective length.

   2) Explain Antenna field zones.

   3) Calculate the Intrinsic impedance η, propagation constant γ, wave velocity v for a conducting medium in which $\mu_r = 1, \varepsilon_r = 1, \sigma = 58$ Ms/m at frequency f = 100 MHz.

   4) A Square Loop of Length 'a' through which current of I amp is passes in clockwise direction. Find H at Centre of the Square Loop.

   5) Derive Expression For Magnetic Field Intensity on the Axis of a Circular Loop.

5. Solve **any two**. **(2×8=16)**

   1) Derive Maxwell equation for Harmonically time Varying Field. Explain word statement of Maxwell equation and physical significance of Displacement current.

   2) Evaluate both side of Stroke's Theorem for the field, $\overline{H} = 6xy\ \bar{a}_x - 3y^2\ \bar{a}_y A/m$ and the rectangular path bounded by the region $2 \leq x \leq 5$, $-1 \leq y \leq 1$, z = 0. Let positive direction of ds be a_z.

   3) Derive Relation for power radiated and radiation resistance of short dipole Antenna.

SLR-VB – 172

Seat No.	

Set S

T.E. (Electronics & Telecommunication Engg.) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGG. & RADIATING SYSTEMS

Day and Date : Thursday, 4-5-2017 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**.*
*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 : **(1×14=14)**

1) A plane electromagnetic wave travels in dielectric medium of relative permittivity 9. Relative to free space, the velocity of propagation in the dielectric is
   a) increased by a factor of 9 b) increased by a factor of 3
   c) unchanged d) reduced by a factor of 1/3

2) The radiation resistance of a $\lambda/16$ wire dipole in free space will be nearly
   a) $1\,\Omega$ b) $3\,\Omega$ c) $13\,\Omega$ d) $30\,\Omega$

3) The Dept. of Penetration of Wave in Lossy Delectric increases with increasing
   a) Permeability b) Permittivity
   c) Wavelength d) None of these

4) Unit of Scalar Magnetic Potential is
   a) Ampere b) wb c) wb/m d) H/m

5) The ratio $\sigma/\omega\varepsilon$ is called
   a) Intrinsic ratio b) Loss tangent
   c) Conduction ratio d) Dissipation factor

6) Potential at all points on the surface of a conductor is
   a) same b) infinity c) not same d) zero

7) The charge density of 10 nC/m^2 is distributed on a plane z = 5m, the electric field intensity at origin is
   a) $180\ \pi a_z$ b) $-180\ \pi a_z$ c) $-10\ \pi a_z$ d) $-360\ \pi a_z$

P.T.O.

8) A point is obtained by intersection of _____ in spherical co-ordinates.
   a) 3 planes
   b) 2 planes and circle
   c) plane, circle and a cone
   d) none of these

9) If the force $\overline{E} = 2\overline{a}x - 2\overline{a}y + 2\overline{a}z$ moves $2\mu C$ charge through a displacement of $4\overline{a}x + 4\overline{a}y - 4\overline{a}z$ the resultant work done is
   a) $-8\mu J$
   b) $8\mu J$
   c) $16\mu J$
   d) $-16\mu J$

10) Potential due to charge at a point situated at ∞ is
   a) ∞
   b) zero
   c) finite
   d) 1

11) A thunder cloud above earth sets up a vertical electric field of 40 V/m. A rain drop carrying a charge of 0.1 micro C lines in this field. The electrostatic force exerted on this rain drop is _____ Newtons.
   a) 40
   b) 4×10^{-6}
   c) 4×10^{-9}
   d) 4

12) If $\overline{E}$ is a vector then $\nabla \cdot \nabla \times \overline{E}$ is
   a) 1
   b) 0
   c) ∞
   d) doesn't exist

13) The intensity of radiation of a Dipole Depends strongly on Antenna. If at a frequency f, the intensity of radiation is 'I'. Then at a frequency of f/2, the intensity will be
   a) I/2
   b) I/4
   c) I/8
   d) I/6

14) A uniform plane wave is one in which
   a) E and H are perpendicular
   b) E and H lie in a plane
   c) $E \times H = 0$
   d) $E \cdot H = 0$

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SLR-VB – 172

Seat No.	

T.E. (Electronics & Telecommunication Engg.) (Part – I) (CGPA)
Examination, 2017
ELECTROMAGNETIC ENGG. & RADIATING SYSTEMS

Day and Date : Thursday, 4-5-2017 Marks : 56

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.*

SECTION – I

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

1) State and prove Divergence Theorem.

2) Transform the vector $\overline{A} = 4\overline{a}\overline{x} - 2\overline{a}\overline{y} - 4\overline{a}\overline{z}$ at point B(x = –2, y = –3, z = 5) to spherical coordinates.

3) Prove that $\overline{E} = -\nabla V$.

4) Find the amount of energy stored if charge of 3 μC is placed at each corner of an equilateral triangle having side of 2m length.

5) Consider two concentric spheres having radius ‘a’ and ‘b’. Derive an equation for capacitance of spherical capacitor.

3. Attempt **any two**. **(2×8=16)**

a) Derive conductor free space boundary condition.

b) Calculate electric flux density at P(2, –3, 6) produced by a point charge of 55 μC at Q(–2, 3, 6) and a uniform line charge of 20 μC /m placed along x-axis.

c) Derive an expression for electric field intensity on z axis produced by an infinite uniform sheet charge placed in z = 0 plane.

SECTION – II

4. Solve **any three**. **(3×4=12)**

   1) Derive the relation between effective area and effective length.

   2) Explain Antenna field zones.

   3) Calculate the Intrinsic impedance η, propagation constant γ, wave velocity v for a conducting medium in which $\mu_r = 1, \varepsilon_r = 1, \sigma = 58$ Ms/m at frequency f = 100 MHz.

   4) A Square Loop of Length 'a' through which current of I amp is passes in clockwise direction. Find H at Centre of the Square Loop.

   5) Derive Expression For Magnetic Field Intensity on the Axis of a Circular Loop.

5. Solve **any two**. **(2×8=16)**

   1) Derive Maxwell equation for Harmonically time Varying Field. Explain word statement of Maxwell equation and physical significance of Displacement current.

   2) Evaluate both side of Stroke's Theorem for the field, $\overline{H} = 6xy\ \bar{a}_x - 3y^2\ \bar{a}_y A/m$ and the rectangular path bounded by the region $2 \leq x \leq 5$, $-1 \leq y \leq 1$, z = 0. Let positive direction of ds be a_z.

   3) Derive Relation for power radiated and radiation resistance of short dipole Antenna.

SLR-VB – 173

Seat No.	

Set P

T.E. (E&TC) (Part – I) Examination, 2017
(CGPA)
PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date : Friday, 5-5-2017 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 : **(1×14=14)**

1) The capacity of communication channel with bandwidth of 4KHz and 15 SNR is approximately
   a) 20 kbps b) 16 kbps c) 10 kbps d) 8 kbps

2) A source delivers symbols m1, m2, m3, m4 with probabilities 1/2, 1/4, 1/8, 1/8 respectively. The entropy of the system is
   a) 1.7 bits/sec b) 1.75 bits/symbols
   c) 1.75 symbols d) None of the above

3) The bandwidth requirement of Pulse Width Modulation is higher than that of Pulse amplitude modulation.
   a) True b) False

4) In a Pulse Code Modulation (PCM) the information is transmitted in the form of
   a) variation in the amplitude of pulses b) variation in the width of pulses
   c) variation in the position of pulses d) code word each of N bit length

5) The non uniform quantization leads to
   a) reduction in transmission bandwidth b) increase in maximum SNR
   c) increase in SNR for low level signals d) simplification of quantization process

6) In _____ encoding, we use three levels: positive, zero and negative.
   a) unipolar b) bipolar
   c) polar d) none of the above

7) The process of correcting channel induced distortion is called
   a) ISI b) Matched filter
   c) Correlation receiver d) Equalization

8) Amplitude shift keying is also known as ON-OFF keying
   a) True b) False

9) The error probability of QPSK is,
   a) better than BPSK b) inferior to BPSK
   c) same as BPSK d) none of the above

10) The transmitted power required for Binary scheme for given Pe is _____ than required for M-ary signaling scheme.
   a) more b) less c) equal d) none of these

11) The probability of error for M-ary FSK decreases as
   a) M-increases b) M-constant c) M-decreases d) None of these

12) A specified sequence used for frame synchronization is called
   a) comma b) period c) prefix d) postfix

13) The correlation receiver consists of
   a) a multiplier & integrator b) an integrator only
   c) multiplier only d) adder and integrator

14) A major problem of multicarrier modulation is
   a) fading b) diversity
   c) high peak to average power ratio d) none of these

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SLR-VB – 173

Seat No.	

T.E. (E&TC) (Part – I) Examination, 2017
(CGPA)
PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date : Friday, 5-5-2017 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 Delta Modulation. What are its drawbacks ?

b) With the waveforms explain how PPM is derived from PAM.

c) Write a note on inter symbol interference.

d) An analog signal bandlimited to 10KHz is quantized in 8 levels of PCM system with probabilities of 1/4, 1/5, 1/5, 1/10, 1/10, 1/20 ,1/20 and 1/20 respectively. Find the entropy and the rate of information.

e) Explain working of adaptive Equalizer.

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

a) Apply Huffman Coding Procedure for following message ensemble. Also calculate average length of code and its efficiency. Assume M = 4.

[X] = [x1 x2 x3 x4 x5 x6 x7 x8]

[P] = [0.2 0.2 0.15 0.15 0.1 0.1 0.05 0.05]

b) Explain any one method of symbol synchronization in detail.

c) With the block diagram explain PCM-TDM Telephone system.

SECTION – II **(28)**

4. Answer **any four** of the following : **(4×4=16)**
   a) Explain the BFSK transmitter with neat block diagram.
   b) What is correlator ? Explain the working with block diagram.
   c) Write a note on principle of MSK signal generation.
   d) Derive an expression for error probability of optimum filter.
   e) Explain any one method of carrier synchronization.

5. Solve **any two** of the following : **(2×6=12)**
   a) Explain the QPSK transmitter and receiver with neat block diagram and phasor diagram.
   b) Write a note on FFT based multicarrier system.
   c) What are different symbol synchronization methods ? Explain early-late gate method in detail.

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SLR-VB – 173

Seat No.	

Set Q

T.E. (E&TC) (Part – I) Examination, 2017
(CGPA)
PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date : Friday, 5-5-2017 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 : **(1×14=14)**

1) Amplitude shift keying is also known as ON-OFF keying
   a) True b) False

2) The error probability of QPSK is,
   a) better than BPSK b) inferior to BPSK
   c) same as BPSK d) none of the above

3) The transmitted power required for Binary scheme for given Pe is _____ than required for M-ary signaling scheme.
   a) more b) less c) equal d) none of these

4) The probability of error for M-ary FSK decreases as
   a) M-increases b) M-constant c) M-decreases d) None of these

5) A specified sequence used for frame synchronization is called
   a) comma b) period c) prefix d) postfix

6) The correlation receiver consists of
   a) a multiplier & integrator b) an integrator only
   c) multiplier only d) adder and integrator

7) A major problem of multicarrier modulation is
   a) fading b) diversity
   c) high peak to average power ratio d) none of these

8) The capacity of communication channel with bandwidth of 4KHz and 15 SNR is approximately
   a) 20 kbps b) 16 kbps c) 10 kbps d) 8 kbps

9) A source delivers symbols m1, m2, m3, m4 with probabilities 1/2, 1/4, 1/8, 1/8 respectively. The entropy of the system is
   a) 1.7 bits/sec b) 1.75 bits/symbols
   c) 1.75 symbols d) None of the above

10) The bandwidth requirement of Pulse Width Modulation is higher than that of Pulse amplitude modulation.
   a) True b) False

11) In a Pulse Code Modulation (PCM) the information is transmitted in the form of
   a) variation in the amplitude of pulses b) variation in the width of pulses
   c) variation in the position of pulses d) code word each of N bit length

12) The non uniform quantization leads to
   a) reduction in transmission bandwidth b) increase in maximum SNR
   c) increase in SNR for low level signals d) simplification of quantization process

13) In _____ encoding, we use three levels: positive, zero and negative.
   a) unipolar b) bipolar
   c) polar d) none of the above

14) The process of correcting channel induced distortion is called
   a) ISI b) Matched filter
   c) Correlation receiver d) Equalization

_____

SLR-VB – 173

Seat No.	

T.E. (E&TC) (Part – I) Examination, 2017
(CGPA)
PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date : Friday, 5-5-2017 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 Delta Modulation. What are its drawbacks ?

b) With the waveforms explain how PPM is derived from PAM.

c) Write a note on inter symbol interference.

d) An analog signal bandlimited to 10KHz is quantized in 8 levels of PCM system with probabilities of 1/4, 1/5, 1/5, 1/10, 1/10, 1/20 ,1/20 and 1/20 respectively. Find the entropy and the rate of information.

e) Explain working of adaptive Equalizer.

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

a) Apply Huffman Coding Procedure for following message ensemble. Also calculate average length of code and its efficiency. Assume M = 4.

[X] = [x1 x2 x3 x4 x5 x6 x7 x8]

[P] = [0.2 0.2 0.15 0.15 0.1 0.1 0.05 0.05]

b) Explain any one method of symbol synchronization in detail.

c) With the block diagram explain PCM-TDM Telephone system.

SECTION – II **(28)**

4. Answer **any four** of the following : **(4×4=16)**
   a) Explain the BFSK transmitter with neat block diagram.
   b) What is correlator ? Explain the working with block diagram.
   c) Write a note on principle of MSK signal generation.
   d) Derive an expression for error probability of optimum filter.
   e) Explain any one method of carrier synchronization.

5. Solve **any two** of the following : **(2×6=12)**
   a) Explain the QPSK transmitter and receiver with neat block diagram and phasor diagram.
   b) Write a note on FFT based multicarrier system.
   c) What are different symbol synchronization methods ? Explain early-late gate method in detail.

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SLR-VB – 173

Seat No.	

Set R

T.E. (E&TC) (Part – I) Examination, 2017
(CGPA)
PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date : Friday, 5-5-2017 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 : **(1×14=14)**

1) The non uniform quantization leads to
   a) reduction in transmission bandwidth b) increase in maximum SNR
   c) increase in SNR for low level signals d) simplification of quantization process

2) In _____ encoding, we use three levels: positive, zero and negative.
   a) unipolar b) bipolar
   c) polar d) none of the above

3) The process of correcting channel induced distortion is called
   a) ISI b) Matched filter
   c) Correlation receiver d) Equalization

4) Amplitude shift keying is also known as ON-OFF keying
   a) True b) False

5) The error probability of QPSK is,
   a) better than BPSK b) inferior to BPSK
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6) The transmitted power required for Binary scheme for given Pe is _____ than required for M-ary signaling scheme.
   a) more b) less c) equal d) none of these

7) The probability of error for M-ary FSK decreases as
   a) M-increases b) M-constant c) M-decreases d) None of these

8) A specified sequence used for frame synchronization is called
   a) comma b) period c) prefix d) postfix

9) The correlation receiver consists of
   a) a multiplier & integrator b) an integrator only
   c) multiplier only d) adder and integrator

10) A major problem of multicarrier modulation is
   a) fading b) diversity
   c) high peak to average power ratio d) none of these

11) The capacity of communication channel with bandwidth of 4KHz and 15 SNR is approximately
   a) 20 kbps b) 16 kbps c) 10 kbps d) 8 kbps

12) A source delivers symbols m1, m2, m3, m4 with probabilities 1/2, 1/4, 1/8, 1/8 respectively. The entropy of the system is
   a) 1.7 bits/sec b) 1.75 bits/symbols
   c) 1.75 symbols d) None of the above

13) The bandwidth requirement of Pulse Width Modulation is higher than that of Pulse amplitude modulation.
   a) True b) False

14) In a Pulse Code Modulation (PCM) the information is transmitted in the form of
   a) variation in the amplitude of pulses b) variation in the width of pulses
   c) variation in the position of pulses d) code word each of N bit length

SLR-VB – 173

Seat No.	

T.E. (E&TC) (Part – I) Examination, 2017
(CGPA)
PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date : Friday, 5-5-2017 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 Delta Modulation. What are its drawbacks ?

b) With the waveforms explain how PPM is derived from PAM.

c) Write a note on inter symbol interference.

d) An analog signal bandlimited to 10KHz is quantized in 8 levels of PCM system with probabilities of 1/4, 1/5, 1/5, 1/10, 1/10, 1/20 ,1/20 and 1/20 respectively. Find the entropy and the rate of information.

e) Explain working of adaptive Equalizer.

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

a) Apply Huffman Coding Procedure for following message ensemble. Also calculate average length of code and its efficiency. Assume M = 4.

[X] = [x1 x2 x3 x4 x5 x6 x7 x8]

[P] = [0.2 0.2 0.15 0.15 0.1 0.1 0.05 0.05]

b) Explain any one method of symbol synchronization in detail.

c) With the block diagram explain PCM-TDM Telephone system.

Set R

SECTION – II **(28)**

4. Answer **any four** of the following : **(4×4=16)**
   a) Explain the BFSK transmitter with neat block diagram.
   b) What is correlator ? Explain the working with block diagram.
   c) Write a note on principle of MSK signal generation.
   d) Derive an expression for error probability of optimum filter.
   e) Explain any one method of carrier synchronization.

5. Solve **any two** of the following : **(2×6=12)**
   a) Explain the QPSK transmitter and receiver with neat block diagram and phasor diagram.
   b) Write a note on FFT based multicarrier system.
   c) What are different symbol synchronization methods ? Explain early-late gate method in detail.

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SLR-VB – 173

Seat No.	

Set S

T.E. (E&TC) (Part – I) Examination, 2017
(CGPA)
PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date : Friday, 5-5-2017 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 : **(1×14=14)**

1) The transmitted power required for Binary scheme for given Pe is _____ than required for M-ary signaling scheme.
   a) more b) less c) equal d) none of these

2) The probability of error for M-ary FSK decreases as
   a) M-increases b) M-constant c) M-decreases d) None of these

3) A specified sequence used for frame synchronization is called
   a) comma b) period c) prefix d) postfix

4) The correlation receiver consists of
   a) a multiplier & integrator b) an integrator only
   c) multiplier only d) adder and integrator

5) A major problem of multicarrier modulation is
   a) fading b) diversity
   c) high peak to average power ratio d) none of these

6) The capacity of communication channel with bandwidth of 4KHz and 15 SNR is approximately
   a) 20 kbps b) 16 kbps c) 10 kbps d) 8 kbps

7) A source delivers symbols m1, m2, m3, m4 with probabilities 1/2, 1/4, 1/8, 1/8 respectively. The entropy of the system is
   a) 1.7 bits/sec b) 1.75 bits/symbols
   c) 1.75 symbols d) None of the above

8) The bandwidth requirement of Pulse Width Modulation is higher than that of Pulse amplitude modulation.
   a) True b) False

9) In a Pulse Code Modulation (PCM) the information is transmitted in the form of
   a) variation in the amplitude of pulses b) variation in the width of pulses
   c) variation in the position of pulses d) code word each of N bit length

10) The non uniform quantization leads to
   a) reduction in transmission bandwidth b) increase in maximum SNR
   c) increase in SNR for low level signals d) simplification of quantization process

11) In _____ encoding, we use three levels: positive, zero and negative.
   a) unipolar b) bipolar
   c) polar d) none of the above

12) The process of correcting channel induced distortion is called
   a) ISI b) Matched filter
   c) Correlation receiver d) Equalization

13) Amplitude shift keying is also known as ON-OFF keying
   a) True b) False

14) The error probability of QPSK is,
   a) better than BPSK b) inferior to BPSK
   c) same as BPSK d) none of the above

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SLR-VB – 173

Seat No.	

T.E. (E&TC) (Part – I) Examination, 2017
(CGPA)
PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date : Friday, 5-5-2017 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 Delta Modulation. What are its drawbacks ?

b) With the waveforms explain how PPM is derived from PAM.

c) Write a note on inter symbol interference.

d) An analog signal bandlimited to 10KHz is quantized in 8 levels of PCM system with probabilities of 1/4, 1/5, 1/5, 1/10, 1/10, 1/20 ,1/20 and 1/20 respectively. Find the entropy and the rate of information.

e) Explain working of adaptive Equalizer.

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

a) Apply Huffman Coding Procedure for following message ensemble. Also calculate average length of code and its efficiency. Assume M = 4.

[X] = [x1 x2 x3 x4 x5 x6 x7 x8]

[P] = [0.2 0.2 0.15 0.15 0.1 0.1 0.05 0.05]

b) Explain any one method of symbol synchronization in detail.

c) With the block diagram explain PCM-TDM Telephone system.

SECTION – II **(28)**

4. Answer **any four** of the following : **(4×4=16)**
   a) Explain the BFSK transmitter with neat block diagram.
   b) What is correlator ? Explain the working with block diagram.
   c) Write a note on principle of MSK signal generation.
   d) Derive an expression for error probability of optimum filter.
   e) Explain any one method of carrier synchronization.

5. Solve **any two** of the following : **(2×6=12)**
   a) Explain the QPSK transmitter and receiver with neat block diagram and phasor diagram.
   b) Write a note on FFT based multicarrier system.
   c) What are different symbol synchronization methods ? Explain early-late gate method in detail.

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SLR-VB – 174

Seat No.	

Set P

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date : Saturday, 6-5-2017 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 alternative :

1) Selection of a model is based on
   a) Requirements
   b) Development team
   c) Users, Project type and associated risk
   d) All of the mentioned

2) Which two models doesn't allow defining requirements early in the cycle ?
   a) Waterfall and RAD
   b) Prototyping and Spiral
   c) Prototyping and RAD
   d) Waterfall and Spiral

3) One can choose Waterfall Model if the project development schedule is tight.
   a) True
   b) False

4) Purpose of process is to deliver software
   a) In time
   b) With acceptable quality
   c) That is cost efficient
   d) Both a) and b)

5) The RUP is normally described from three perspectives-dynamic, static and practice. What does static perspective do ?
   a) it shows the process activities that are enacted
   b) It suggests good practices to be used during the process
   c) It shows the phases of the model over time
   d) None of the above

P.T.O.

6) Arrange the following steps to form a basic/general Engineering Process Model.
   1) Test 2) Design 3) Install 4) Specification
   5) Manufacture 6) Maintain
   a) 2, 4, 5, 1, 6, 3 b) 4, 2, 5, 1, 3, 6
   c) 2, 4, 5, 1, 3, 6 d) 4, 2, 5, 1, 6, 3

7) The user system requirements are the parts of which document ?
   a) SDD b) SRS
   c) DDD d) None of the above

8) A Delay in _____ activities will cause a delay in completion date of project.
   a) Free float b) Base lined
   c) Critical path d) Scheduled

9) The person handles many projects simultaneously
   a) Program manager b) Project manager
   c) Team leader d) Software developer

10) Which below is true for risk ?
   a) Relates to future
   b) Involves causes and effects
   c) Not of self contained topic within program manager
   d) All

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) CPM stands for
   a) Critical Path Machine b) Critical Path Model
   c) Critical Path Method d) None

13) Which of following is risk identification approach ?
   a) Network analysis b) Forward Tracking
   c) Checklist d) All

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

_____

SLR-VB – 174

Seat No.	

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date : Saturday, 6-5-2017 Marks : 56

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

SECTION – I

2. Solve **any three** : **(3×4=12)**

   a) Explain Test Automation.

   b) Write note on RUP.

   c) List advantages of CBSE and explain.

   d) Explain Software Life Cycle concept.

   OR

   Write note on SDLC.

3. Solve **any two** : **(8×2=16)**

   a) List types of non-functional requirement. Explain general structure of requirement.

   b) Explain software life cycle using Prototyping.

   c) List system models and explain any one of them with example.

SECTION – II

4. Solve **any four** (**3.5** marks **each**) : **(3.5×4=14)**

   1) Explain cost-benefit evaluation techniques.

   2) What is change control ? Explain change control procedures.

   3) Explain categories of risk.

   4) Write aids of program management with dependency diagram.

   5) Write note on risk identification.

5. Solve **any two** (**7** marks **each**) : **(7×2=14)**

   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 disadvantage of charts.
   3) Write stepwise project planning activates.

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SLR-VB – 174

Seat No.	

Set Q

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date : Saturday, 6-5-2017 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 alternative :

1) A Delay in _____ activities will cause a delay in completion date of project.
   a) Free float b) Base lined
   c) Critical path d) Scheduled

2) The person handles many projects simultaneously
   a) Program manager b) Project manager
   c) Team leader d) Software developer

3) Which below is true for risk ?
   a) Relates to future
   b) Involves causes and effects
   c) Not of self contained topic within program manager
   d) All

4) 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

5) CPM stands for
   a) Critical Path Machine b) Critical Path Model
   c) Critical Path Method d) None

6) Which of following is risk identification approach ?
   a) Network analysis b) Forward Tracking
   c) Checklist d) All

P.T.O.

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

8) Selection of a model is based on
   a) Requirements
   b) Development team
   c) Users, Project type and associated risk
   d) All of the mentioned

9) Which two models doesn't allow defining requirements early in the cycle ?
   a) Waterfall and RAD
   b) Prototyping and Spiral
   c) Prototyping and RAD
   d) Waterfall and Spiral

10) One can choose Waterfall Model if the project development schedule is tight.
   a) True
   b) False

11) Purpose of process is to deliver software
   a) In time
   b) With acceptable quality
   c) That is cost efficient
   d) Both a) and b)

12) The RUP is normally described from three perspectives-dynamic, static and practice. What does static perspective do ?
   a) it shows the process activities that are enacted
   b) It suggests good practices to be used during the process
   c) It shows the phases of the model over time
   d) None of the above

13) Arrange the following steps to form a basic/general Engineering Process Model.
   1) Test 2) Design 3) Install 4) Specification
   5) Manufacture 6) Maintain
   a) 2, 4, 5, 1, 6, 3
   b) 4, 2, 5, 1, 3, 6
   c) 2, 4, 5, 1, 3, 6
   d) 4, 2, 5, 1, 6, 3

14) The user system requirements are the parts of which document ?
   a) SDD
   b) SRS
   c) DDD
   d) None of the above

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SLR-VB – 174

Seat No.	

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date : Saturday, 6-5-2017 Marks : 56

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

SECTION – I

2. Solve **any three** : **(3×4=12)**

   a) Explain Test Automation.

   b) Write note on RUP.

   c) List advantages of CBSE and explain.

   d) Explain Software Life Cycle concept.

   OR

   Write note on SDLC.

3. Solve **any two** : **(8×2=16)**

   a) List types of non-functional requirement. Explain general structure of requirement.

   b) Explain software life cycle using Prototyping.

   c) List system models and explain any one of them with example.

SECTION – II

4. Solve **any four** (**3.5** marks **each**) : **(3.5×4=14)**

   1) Explain cost-benefit evaluation techniques.

   2) What is change control ? Explain change control procedures.

   3) Explain categories of risk.

   4) Write aids of program management with dependency diagram.

   5) Write note on risk identification.

Set Q

5. Solve **any two** (**7** marks **each**) : **(7×2=14)**

   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 disadvantage of charts.
   3) Write stepwise project planning activates.

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SLR-VB – 174

Seat No.	

Set R

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date : Saturday, 6-5-2017 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 alternative :

1) The RUP is normally described from three perspectives-dynamic, static and practice. What does static perspective do ?

a) it shows the process activities that are enacted

b) It suggests good practices to be used during the process

c) It shows the phases of the model over time

d) None of the above

2) Arrange the following steps to form a basic/general Engineering Process Model.

1) Test 2) Design 3) Install 4) Specification

5) Manufacture 6) Maintain

a) 2, 4, 5, 1, 6, 3 b) 4, 2, 5, 1, 3, 6

c) 2, 4, 5, 1, 3, 6 d) 4, 2, 5, 1, 6, 3

3) The user system requirements are the parts of which document ?

a) SDD b) SRS

c) DDD d) None of the above

4) A Delay in _____ activities will cause a delay in completion date of project.

a) Free float b) Base lined

c) Critical path d) Scheduled

5) The person handles many projects simultaneously

a) Program manager b) Project manager

c) Team leader d) Software developer

P.T.O.

6) Which below is true for risk ?
   a) Relates to future
   b) Involves causes and effects
   c) Not of self contained topic within program manager
   d) All

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) CPM stands for
   a) Critical Path Machine
   b) Critical Path Model
   c) Critical Path Method
   d) None

9) Which of following is risk identification approach ?
   a) Network analysis
   b) Forward Tracking
   c) Checklist
   d) All

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

11) Selection of a model is based on
   a) Requirements
   b) Development team
   c) Users, Project type and associated risk
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12) Which two models doesn't allow defining requirements early in the cycle ?
   a) Waterfall and RAD
   b) Prototyping and Spiral
   c) Prototyping and RAD
   d) Waterfall and Spiral

13) One can choose Waterfall Model if the project development schedule is tight.
   a) True
   b) False

14) Purpose of process is to deliver software
   a) In time
   b) With acceptable quality
   c) That is cost efficient
   d) Both a) and b)

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SLR-VB – 174

Seat No.	

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date : Saturday, 6-5-2017 Marks : 56

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

SECTION – I

2. Solve **any three** : **(3×4=12)**

   a) Explain Test Automation.

   b) Write note on RUP.

   c) List advantages of CBSE and explain.

   d) Explain Software Life Cycle concept.

   OR

   Write note on SDLC.

3. Solve **any two** : **(8×2=16)**

   a) List types of non-functional requirement. Explain general structure of requirement.

   b) Explain software life cycle using Prototyping.

   c) List system models and explain any one of them with example.

SECTION – II

4. Solve **any four** (**3.5** marks **each**) : **(3.5×4=14)**

   1) Explain cost-benefit evaluation techniques.

   2) What is change control ? Explain change control procedures.

   3) Explain categories of risk.

   4) Write aids of program management with dependency diagram.

   5) Write note on risk identification.

5. Solve **any two** (**7** marks **each**) : **(7×2=14)**

   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 disadvantage of charts.
   3) Write stepwise project planning activates.

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SLR-VB – 174

Seat No.	

Set S

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date : Saturday, 6-5-2017 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 alternative :

1) Which below is true for risk ?
   a) Relates to future
   b) Involves causes and effects
   c) Not of self contained topic within program manager
   d) All

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) CPM stands for
   a) Critical Path Machine
   b) Critical Path Model
   c) Critical Path Method
   d) None

4) Which of following is risk identification approach ?
   a) Network analysis
   b) Forward Tracking
   c) Checklist
   d) All

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

6) Selection of a model is based on
   a) Requirements
   b) Development team
   c) Users, Project type and associated risk
   d) All of the mentioned

P.T.O.

7) Which two models doesn't allow defining requirements early in the cycle ?
   a) Waterfall and RAD
   b) Prototyping and Spiral
   c) Prototyping and RAD
   d) Waterfall and Spiral

8) One can choose Waterfall Model if the project development schedule is tight.
   a) True
   b) False

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   a) In time
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10) The RUP is normally described from three perspectives-dynamic, static and practice. What does static perspective do ?
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   b) It suggests good practices to be used during the process
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   5) Manufacture 6) Maintain
   a) 2, 4, 5, 1, 6, 3
   b) 4, 2, 5, 1, 3, 6
   c) 2, 4, 5, 1, 3, 6
   d) 4, 2, 5, 1, 6, 3

12) The user system requirements are the parts of which document ?
   a) SDD
   b) SRS
   c) DDD
   d) None of the above

13) A Delay in _____ activities will cause a delay in completion date of project.
   a) Free float
   b) Base lined
   c) Critical path
   d) Scheduled

14) The person handles many projects simultaneously
   a) Program manager
   b) Project manager
   c) Team leader
   d) Software developer

_____

SLR-VB – 174

Seat No.	

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date : Saturday, 6-5-2017 Marks : 56

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

SECTION – I

2. Solve **any three** : **(3×4=12)**

   a) Explain Test Automation.

   b) Write note on RUP.

   c) List advantages of CBSE and explain.

   d) Explain Software Life Cycle concept.

   OR

   Write note on SDLC.

3. Solve **any two** : **(8×2=16)**

   a) List types of non-functional requirement. Explain general structure of requirement.

   b) Explain software life cycle using Prototyping.

   c) List system models and explain any one of them with example.

SECTION – II

4. Solve **any four** (**3.5** marks **each**) : **(3.5×4=14)**

   1) Explain cost-benefit evaluation techniques.

   2) What is change control ? Explain change control procedures.

   3) Explain categories of risk.

   4) Write aids of program management with dependency diagram.

   5) Write note on risk identification.

5. Solve **any two** (**7** marks **each**) : **(7×2=14)**

   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 disadvantage of charts.
   3) Write stepwise project planning activates.

_____

SLR-VB – 175

Seat No.	

Set P

T.E. (E & TC) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Monday, 8-5-2017 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**

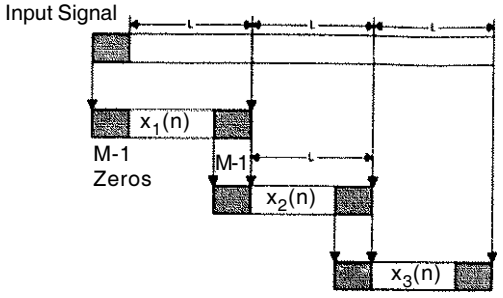
1) Phase angle of x + jy is represented by formula
A) sine(y/x) B) arcsine(y/x)
C) tan(y/x) D) arctan(y/x)

2) If X(k) is the N-point DFT of a sequence x(n), then what is the DFT of x*(n) ?
A) X(N-k) B) X*(k)
C) X*(N-k) D) None of the mentioned

3) The finite observation interval for the signal places a limit on the frequency resolution.
A) False B) True

4) In overlap save method of long sequence filtering, what is the length of the input sequence block ?
A) L + M + 1 B) L + M
C) L + M – 1 D) None of the mentioned

5) In which of the following methods, the input sequence is considered as shown in the below diagram ?



A) Overlap save method B) Overlap add method

P.T.O.

6) What is the real part of the N point DFT $x_R(k)$ of a complex valued sequence x(n) ?

A) $\sum_{n=0}^{N-1}\left[x_R(n).\cos\left(\frac{2\pi kn}{N}\right) - x_I(n).\sin\left(\frac{2\pi kn}{N}\right)\right]$

B) $\sum_{n=0}^{N-1}\left[x_R(n).\cos\left(\frac{2\pi kn}{N}\right) + x_I(n).\sin\left(\frac{2\pi kn}{N}\right)\right]$

C) $\sum_{n=0}^{\infty}\left[x_R(n).\cos\left(\frac{2\pi kn}{N}\right) + \sin\left(\frac{2\pi kn}{N}\right)\right]$

D) None of the mentioned

7) Divide-and-conquer approach is based on the decomposition of an N-point DFT into successively smaller DFTs. This basic approach leads to FFT algorithms.
A) True B) False

8) Impulse invariant method uses transformation
A) $z = e^{-ST}$ B) $z = e^{ST}$ C) $z = e^{ET}$ D) $z = e^{jwT}$

9) Properties of Butterworth low pass filter is given by
A) The poles of Butterworth filter lies on a circle
B) The poles of Butterworth filter lies outside a circle
C) The poles of Butterworth filter lies inside a circle
D) None

10) FIR is always stable because
A) Poles lie outside a circle
B) Poles lie inside a circle
C) Poles lie at origin
D) None

11) Which of the following filter have linear phase characteristic ?
A) IIR B) LP C) HP D) FIR

12) When analog Butterworth filter is converted to DT filter using impulse invariant technique, then
A) Aliasing can be eliminated
B) Aliasing is always present
C) Aliasing can be reduced by reducing T
D) Aliasing can not be reduced by reducing T

13) In IIR system, which of the following structure will give direct relation between time domain and Z domain.
A) Direct form I B) Direct form II
C) Cascade form D) Parallel form

14) The factor that influence the choice of realization of structure is
A) Memory requirement B) Computational complexity
C) Parallel processing D) All of the above

SLR-VB – 175

Seat No.	

T.E. (E & TC) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Monday, 8-5-2017 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.*

SECTION – I

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

   a) Determine DFT of $x[n]$ if $x[n] = \{1, \underset{\uparrow}{1}, 1, 1\}$.

   b) Check the linearity of the system $y[n] = e^{x[n]}$ and $y[n] = x[-n]$.

   c) Explain Goertzel Algorithm.

   d) Derive any two properties of DFT.

   e) Find autocorrelation of the sequence $x[n] = \{2, \underset{\uparrow}{2}, 4, 4\}$.

3. Attempt **any one** of the following : **(12×1=12)**

   a) Find linear convolution using overlap-Add method of the following sequences : X[n] = {3, 0, –2, 0, 2, 1, 0, –2, –1, 0} and h[n] = {2, 2, 1}

   b) If x[n] = {1, 2, 3, 4} and h[n] = {5, 6, 0, 0} then find circular convolution using DFT and IDFT.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Give details about window functions used in FIR filter design.

   b) What is warping effect ? What is its effects on magnitude and phase response ?

   c) For analog transfer function $H(s) = \frac{2}{(s+1)(S+2)}$ determining H(Z) using bilinear transformation with T = 1 sec.

d) Realize the system in parallel form $H(Z) = \frac{3 + 3.6Z^{-1} + 0.6Z^{-2}}{1 + 0.1Z^{-1} - 0.2Z^{-2}}$.

e) Explain the application of DSP in telecommunication in detail.

5. Solve **any two** : **(6×2=12)**

a) Design an ideal low pass filter whose desired frequency response is

$$H_d(e^{jw}) = 1 \quad \text{for } \frac{\pi}{3} \geq w \geq -\frac{\pi}{3}$$
$$= 0 \quad \text{for } 0 \geq |w| > \frac{\pi}{3}$$

Determine the impulse response h(n) for N = 9. Determine H(Z).

b) Realize using Direct form I and Direct form II

$y(n) = 2y(n-1) + 3y(n-2) + x(n) + 2x(n-1) + 3x(n-2)$

c) Design a digital Butterworth filter satisfying the constraints

$$0.707 \leq \left|H\left(e^{jw}\right)\right| \leq 1 \text{ for } \quad 0 \leq w \leq \frac{\pi}{2}$$

$$\left|H\left(e^{jw}\right)\right| \leq 0.2 \quad \text{for} \quad \frac{3\pi}{4} \leq w \leq \pi$$

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SLR-VB – 175

Seat No.	

Set Q

T.E. (E & TC) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Monday, 8-5-2017 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) Impulse invariant method uses transformation
A) $z = e^{-ST}$ B) $z = e^{ST}$ C) $z = e^{ET}$ D) $z = e^{jwT}$

2) Properties of Butterworth low pass filter is given by
A) The poles of Butterworth filter lies on a circle
B) The poles of Butterworth filter lies outside a circle
C) The poles of Butterworth filter lies inside a circle
D) None

3) FIR is always stable because
A) Poles lie outside a circle B) Poles lie inside a circle
C) Poles lie at origin D) None

4) Which of the following filter have linear phase characteristic ?
A) IIR B) LP C) HP D) FIR

5) When analog Butterworth filter is converted to DT filter using impulse invariant technique, then
A) Aliasing can be eliminated
B) Aliasing is always present
C) Aliasing can be reduced by reducing T
D) Aliasing can not be reduced by reducing T

6) In IIR system, which of the following structure will give direct relation between time domain and Z domain.
A) Direct form I B) Direct form II
C) Cascade form D) Parallel form

P.T.O.

7) The factor that influence the choice of realization of structure is
   A) Memory requirement
   B) Computational complexity
   C) Parallel processing
   D) All of the above

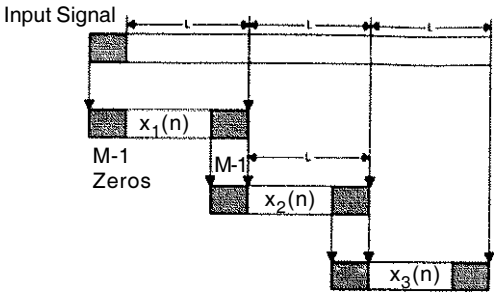
8) Phase angle of x + jy is represented by formula
   A) sine(y/x)
   B) arcsine(y/x)
   C) tan(y/x)
   D) arctan(y/x)

9) If X(k) is the N-point DFT of a sequence x(n), then what is the DFT of x*(n) ?
   A) X(N-k)
   B) X*(k)
   C) X*(N-k)
   D) None of the mentioned

10) The finite observation interval for the signal places a limit on the frequency resolution.
   A) False
   B) True

11) In overlap save method of long sequence filtering, what is the length of the input sequence block ?
   A) L + M + 1
   B) L + M
   C) L + M – 1
   D) None of the mentioned

12) In which of the following methods, the input sequence is considered as shown in the below diagram ?



   A) Overlap save method
   B) Overlap add method

13) What is the real part of the N point DFT $x_R(k)$ of a complex valued sequence x(n) ?

   A) $\sum_{n=0}^{N-1}\left[x_R(n).\cos\left(\frac{2\pi kn}{N}\right) - x_I(n).\sin\left(\frac{2\pi kn}{N}\right)\right]$

   B) $\sum_{n=0}^{N-1}\left[x_R(n).\cos\left(\frac{2\pi kn}{N}\right) + x_I(n).\sin\left(\frac{2\pi kn}{N}\right)\right]$

   C) $\sum_{n=0}^{\infty}\left[x_R(n).\cos\left(\frac{2\pi kn}{N}\right) + \sin\left(\frac{2\pi kn}{N}\right)\right]$

   D) None of the mentioned

14) Divide-and-conquer approach is based on the decomposition of an N-point DFT into successively smaller DFTs. This basic approach leads to FFT algorithms.
   A) True
   B) False

SLR-VB – 175

Seat No.	

T.E. (E & TC) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Monday, 8-5-2017 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.*

SECTION – I

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

   a) Determine DFT of $x[n]$ if $x[n] = \{1, \underset{\uparrow}{1}, 1, 1\}$.

   b) Check the linearity of the system $y[n] = e^{x[n]}$ and $y[n] = x[-n]$.

   c) Explain Goertzel Algorithm.

   d) Derive any two properties of DFT.

   e) Find autocorrelation of the sequence $x[n] = \{2, \underset{\uparrow}{2}, 4, 4\}$.

3. Attempt **any one** of the following : **(12×1=12)**

   a) Find linear convolution using overlap-Add method of the following sequences : X[n] = {3, 0, –2, 0, 2, 1, 0, –2, –1, 0} and h[n] = {2, 2, 1}

   b) If x[n] = {1, 2, 3, 4} and h[n] = {5, 6, 0, 0} then find circular convolution using DFT and IDFT.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Give details about window functions used in FIR filter design.

   b) What is warping effect ? What is its effects on magnitude and phase response ?

   c) For analog transfer function $H(s) = \frac{2}{(s+1)(S+2)}$ determining H(Z) using bilinear transformation with T = 1 sec.

d) Realize the system in parallel form $H(Z) = \frac{3 + 3.6Z^{-1} + 0.6Z^{-2}}{1 + 0.1Z^{-1} - 0.2Z^{-2}}$.

e) Explain the application of DSP in telecommunication in detail.

5. Solve **any two** : **(6×2=12)**

a) Design an ideal low pass filter whose desired frequency response is

$$H_d(e^{jw}) = 1 \quad \text{for } \frac{\pi}{3} \geq w \geq -\frac{\pi}{3}$$
$$= 0 \quad \text{for } 0 \geq |w| > \frac{\pi}{3}$$

Determine the impulse response h(n) for N = 9. Determine H(Z).

b) Realize using Direct form I and Direct form II

$y(n) = 2y(n-1) + 3y(n-2) + x(n) + 2x(n-1) + 3x(n-2)$

c) Design a digital Butterworth filter satisfying the constraints

$$0.707 \leq \left|H\left(e^{jw}\right)\right| \leq 1 \text{ for } \quad 0 \leq w \leq \frac{\pi}{2}$$

$$\left|H\left(e^{jw}\right)\right| \leq 0.2 \quad \text{for} \quad \frac{3\pi}{4} \leq w \leq \pi$$

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SLR-VB – 175

Seat No.	

Set R

T.E. (E & TC) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Monday, 8-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

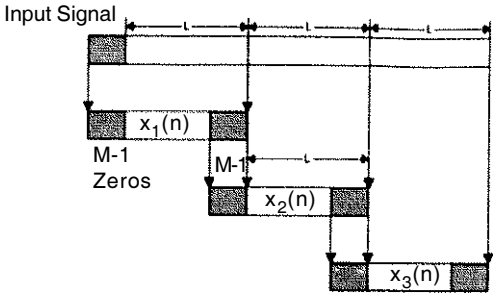
Instructions : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) Assume suitable data ***if*** *necessary.*
4) Q. No. ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *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) In which of the following methods, the input sequence is considered as shown in the below diagram ?



A) Overlap save method B) Overlap add method

2) What is the real part of the N point DFT $x_R(k)$ of a complex valued sequence x(n) ?

A) $\sum_{n=0}^{N-1}\left[x_R(n).\cos\left(\frac{2\pi kn}{N}\right) - x_I(n).\sin\left(\frac{2\pi kn}{N}\right)\right]$

B) $\sum_{n=0}^{N-1}\left[x_R(n).\cos\left(\frac{2\pi kn}{N}\right) + x_I(n).\sin\left(\frac{2\pi kn}{N}\right)\right]$

C) $\sum_{n=0}^{\infty}\left[x_R(n).\cos\left(\frac{2\pi kn}{N}\right) + \sin\left(\frac{2\pi kn}{N}\right)\right]$

D) None of the mentioned

P.T.O.

3) Divide-and-conquer approach is based on the decomposition of an N-point DFT into successively smaller DFTs. This basic approach leads to FFT algorithms.
   A) True B) False

4) Impulse invariant method uses transformation
   A) $z = e^{-ST}$ B) $z = e^{ST}$ C) $z = e^{ET}$ D) $z = e^{jwT}$

5) Properties of Butterworth low pass filter is given by
   A) The poles of Butterworth filter lies on a circle
   B) The poles of Butterworth filter lies outside a circle
   C) The poles of Butterworth filter lies inside a circle
   D) None

6) FIR is always stable because
   A) Poles lie outside a circle B) Poles lie inside a circle
   C) Poles lie at origin D) None

7) Which of the following filter have linear phase characteristic ?
   A) IIR B) LP C) HP D) FIR

8) When analog Butterworth filter is converted to DT filter using impulse invariant technique, then
   A) Aliasing can be eliminated
   B) Aliasing is always present
   C) Aliasing can be reduced by reducing T
   D) Aliasing can not be reduced by reducing T

9) In IIR system, which of the following structure will give direct relation between time domain and Z domain.
   A) Direct form I B) Direct form II
   C) Cascade form D) Parallel form

10) The factor that influence the choice of realization of structure is
   A) Memory requirement B) Computational complexity
   C) Parallel processing D) All of the above

11) Phase angle of x + jy is represented by formula
   A) sine(y/x) B) arcsine(y/x)
   C) tan(y/x) D) arctan(y/x)

12) If X(k) is the N-point DFT of a sequence x(n), then what is the DFT of x*(n) ?
   A) X(N-k) B) X*(k)
   C) X*(N-k) D) None of the mentioned

13) The finite observation interval for the signal places a limit on the frequency resolution.
   A) False B) True

14) In overlap save method of long sequence filtering, what is the length of the input sequence block ?
   A) L + M + 1 B) L + M
   C) L + M – 1 D) None of the mentioned

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SLR-VB – 175

Seat No.	

T.E. (E & TC) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Monday, 8-5-2017 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.*

SECTION – I

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

   a) Determine DFT of $x[n]$ if $x[n] = \{1, \underset{\uparrow}{1}, 1, 1,\}$.

   b) Check the linearity of the system $y[n] = e^{x[n]}$ and $y[n] = x[-n]$.

   c) Explain Goertzel Algorithm.

   d) Derive any two properties of DFT.

   e) Find autocorrelation of the sequence $x[n] = \{\underset{\uparrow}{2}, 2, 4, 4\}$.

3. Attempt **any one** of the following : **(12×1=12)**

   a) Find linear convolution using overlap-Add method of the following sequences : X[n] = {3, 0, –2, 0, 2, 1, 0, –2, –1, 0} and h[n] = {2, 2, 1}

   b) If x[n] = {1, 2, 3, 4} and h[n] = {5, 6, 0, 0} then find circular convolution using DFT and IDFT.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Give details about window functions used in FIR filter design.

   b) What is warping effect ? What is its effects on magnitude and phase response ?

   c) For analog transfer function $H(s) = \frac{2}{(s+1)(S+2)}$ determining H(Z) using bilinear transformation with T = 1 sec.

d) Realize the system in parallel form $H(Z) = \frac{3 + 3.6Z^{-1} + 0.6Z^{-2}}{1 + 0.1Z^{-1} - 0.2Z^{-2}}$.

e) Explain the application of DSP in telecommunication in detail.

5. Solve **any two** : **(6×2=12)**

a) Design an ideal low pass filter whose desired frequency response is

$$H_d(e^{jw}) = 1 \quad \text{for } \frac{\pi}{3} \geq w \geq -\frac{\pi}{3}$$
$$= 0 \quad \text{for } 0 \geq |w| > \frac{\pi}{3}$$

Determine the impulse response h(n) for N = 9. Determine H(Z).

b) Realize using Direct form I and Direct form II

$y(n) = 2y(n-1) + 3y(n-2) + x(n) + 2x(n-1) + 3x(n-2)$

c) Design a digital Butterworth filter satisfying the constraints

$$0.707 \leq \left|H\left(e^{jw}\right)\right| \leq 1 \text{ for } \quad 0 \leq w \leq \frac{\pi}{2}$$

$$\left|H\left(e^{jw}\right)\right| \leq 0.2 \quad \text{for} \quad \frac{3\pi}{4} \leq w \leq \pi$$

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SLR-VB – 175

Seat No.	

Set S

T.E. (E & TC) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Monday, 8-5-2017 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) FIR is always stable because
A) Poles lie outside a circle B) Poles lie inside a circle
C) Poles lie at origin D) None

2) Which of the following filter have linear phase characteristic ?
A) IIR B) LP C) HP D) FIR

3) When analog Butterworth filter is converted to DT filter using impulse invariant technique, then
A) Aliasing can be eliminated
B) Aliasing is always present
C) Aliasing can be reduced by reducing T
D) Aliasing can not be reduced by reducing T

4) In IIR system, which of the following structure will give direct relation between time domain and Z domain.
A) Direct form I B) Direct form II
C) Cascade form D) Parallel form

5) The factor that influence the choice of realization of structure is
A) Memory requirement B) Computational complexity
C) Parallel processing D) All of the above

6) Phase angle of x + jy is represented by formula
A) sine(y/x) B) arcsine(y/x)
C) tan(y/x) D) arctan(y/x)

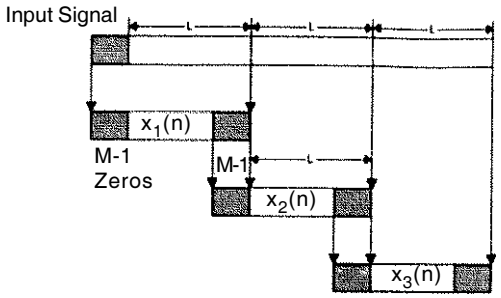
P.T.O.

7) If X(k) is the N-point DFT of a sequence x(n), then what is the DFT of x*(n) ?
   A) X(N-k) B) X*(k)
   C) X*(N-k) D) None of the mentioned

8) The finite observation interval for the signal places a limit on the frequency resolution.
   A) False B) True

9) In overlap save method of long sequence filtering, what is the length of the input sequence block ?
   A) L + M + 1 B) L + M
   C) L + M – 1 D) None of the mentioned

10) In which of the following methods, the input sequence is considered as shown in the below diagram ?



   A) Overlap save method B) Overlap add method

11) What is the real part of the N point DFT $x_R(k)$ of a complex valued sequence x(n) ?

   A) $\sum_{n=0}^{N-1}\left[x_R(n).\cos\left(\frac{2\pi kn}{N}\right) - x_I(n).\sin\left(\frac{2\pi kn}{N}\right)\right]$

   B) $\sum_{n=0}^{N-1}\left[x_R(n).\cos\left(\frac{2\pi kn}{N}\right) + x_I(n).\sin\left(\frac{2\pi kn}{N}\right)\right]$

   C) $\sum_{n=0}^{\infty}\left[x_R(n).\cos\left(\frac{2\pi kn}{N}\right) + \sin\left(\frac{2\pi kn}{N}\right)\right]$

   D) None of the mentioned

12) Divide-and-conquer approach is based on the decomposition of an N-point DFT into successively smaller DFTs. This basic approach leads to FFT algorithms.
   A) True B) False

13) Impulse invariant method uses transformation
   A) $z = e^{-ST}$ B) $z = e^{ST}$ C) $z = e^{ET}$ D) $z = e^{jwT}$

14) Properties of Butterworth low pass filter is given by
   A) The poles of Butterworth filter lies on a circle
   B) The poles of Butterworth filter lies outside a circle
   C) The poles of Butterworth filter lies inside a circle
   D) None

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SLR-VB – 175

Seat No.	

T.E. (E & TC) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Monday, 8-5-2017 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.*

SECTION – I

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

   a) Determine DFT of $x[n]$ if $x[n] = \{1, \underset{\uparrow}{1}, 1, 1,\}$.

   b) Check the linearity of the system $y[n] = e^{x[n]}$ and $y[n] = x[-n]$.

   c) Explain Goertzel Algorithm.

   d) Derive any two properties of DFT.

   e) Find autocorrelation of the sequence $x[n] = \{2, \underset{\uparrow}{2}, 4, 4\}$.

3. Attempt **any one** of the following : **(12×1=12)**

   a) Find linear convolution using overlap-Add method of the following sequences : X[n] = {3, 0, –2, 0, 2, 1, 0, –2, –1, 0} and h[n] = {2, 2, 1}

   b) If x[n] = {1, 2, 3, 4} and h[n] = {5, 6, 0, 0} then find circular convolution using DFT and IDFT.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Give details about window functions used in FIR filter design.

   b) What is warping effect ? What is its effects on magnitude and phase response ?

   c) For analog transfer function $H(s) = \frac{2}{(s+1)(S+2)}$ determining H(Z) using bilinear transformation with T = 1 sec.

d) Realize the system in parallel form $H(Z) = \frac{3 + 3.6Z^{-1} + 0.6Z^{-2}}{1 + 0.1Z^{-1} - 0.2Z^{-2}}$.

e) Explain the application of DSP in telecommunication in detail.

5. Solve **any two** : **(6×2=12)**

a) Design an ideal low pass filter whose desired frequency response is

$$H_d(e^{jw}) = 1 \quad \text{for } \frac{\pi}{3} \geq w \geq -\frac{\pi}{3}$$
$$= 0 \quad \text{for } 0 \geq |w| > \frac{\pi}{3}$$

Determine the impulse response h(n) for N = 9. Determine H(Z).

b) Realize using Direct form I and Direct form II

$y(n) = 2y(n-1) + 3y(n-2) + x(n) + 2x(n-1) + 3x(n-2)$

c) Design a digital Butterworth filter satisfying the constraints

$$0.707 \leq \left|H\left(e^{jw}\right)\right| \leq 1 \text{ for } \quad 0 \leq w \leq \frac{\pi}{2}$$

$$\left|H\left(e^{jw}\right)\right| \leq 0.2 \quad \text{for} \quad \frac{3\pi}{4} \leq w \leq \pi$$

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SLR-VB – 176

Seat No.	

Set **P**

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS

Day and Date : Tuesday, 9-5-2017 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) Byte length, machine cycle and T-states required to execute the instruction STA address respectively is
a) 2, 4, 13 b) 3, 4, 13 c) 3, 4, 15 d) None

2) _____ memory locations can be addressed directly by Intel 8085.
a) 34 K b) 44 K c) 54 K d) 64 K

3) The number of software interrupts in 8085 is
a) 5 b) 8 c) 9 d) 10

4) Identify the non-makeable interrupt in the following
a) RST 4.5 (TRAP) b) RST 5.5 c) RST 6.5 d) RST 7.5

5) The status of S0 and S1 pins for memory read is
a) 0, 0 b) 0, 1 c) 1, 0 d) 1,1

6) The contents of registers A and B after execution of following instructions are

```
XRA A
MVI B, 4 AH
SUI 4FH
ANA B
HLT
```

a) 05, 4A b) 4F, 00 c) B1, 4A d) 00, 4A

7) In an 8085 based system, the maximum number of input output devices can be connected using I/O mapped I/O method is
   a) 64 b) 512 c) 256 d) 65536
8) All the functions of the ports of 8255 are achieved by programming the bits of an internal register called
   a) Data bus control b) Read logic control
   c) Control word register d) None
9) The programmable timer device (8253) contains three independent _____ bit counters.
   a) 8 b) 16 c) 20 d) 32
10) The input clock frequency of 8251 is _____ times the TXC or RXC frequency.
   a) 10 b) 15 c) 20 d) 30
11) The mode of 8253 that is used to interrupt the processor by setting a suitable terminal count is
   a) mode 0 b) mode 1 c) mode 2 d) mode 3
12) The generation of square wave is possible using 8253 in the mode
   a) mode 1 b) mode 2 c) mode 3 d) mode 4
13) In control word register of 8253, if SC1 = 0 and SC0 = 1, then the counter selected is
   a) counter 0 b) counter 1 c) counter 2 d) none
14) 8253 counter pin OUT is to
   a) Indicates the counting process ends
   b) Start counting process
   c) Control counting process
   d) Input clock signal

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SLR-VB – 176

Seat No.	

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS

Day and Date : Tuesday, 9-5-2017 Marks : 56

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

SECTION – I

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

   1) Draw and explain demultiplexing of address and data bus.

   2) Write ALP for arranging ten 8 bit number in reverse order with starting address 2000 H.

   3) Differentiate between hardware and software interrupt.

   4) How microprocessor differentiates between data and OPCODE ?

   5) Write a timing diagram of IN instruction.

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

   1) Interface 6K × 8 memory using 2K × 8. Assume starting address. Show the address range of each chip.

   2) Explain following decoding technique in detail.
      a) Absolute Decoding
      b) Partial decoding

   3) Explain the RIM and SIM instruction formats.

SECTION – II

4. Explain **any four** of the following : **(4×4=16)**

   1) Draw and explain working of weighted register type DAC.

   2) Compare 8085 and 8086.

   3) Write ALP to generate a square wave of 1 KHz frequency on OUT 1 pin of 8253. Assume clock frequency as 1 MHz, and address of CWR as $(0B)_H$.

   4) Draw architecture of 8086.

   5) Explain I/O operating modes of 8255.

5. Explain **any two** of the following : **(6×2=12)**

   1) Explain mode word format and command word format of 8251 in detail.

   2) Interface stepper motor to 8085 microprocessor. WALP to rotate stepper motor by one full revolution in clockwise direction stop.

   3) Interface DAC IC with 8085 (in memory mapped IO). Write a DAC program to generate square waveform.

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SLR-VB – 176

Seat No.	

Set **Q**

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS

Day and Date : Tuesday, 9-5-2017 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) All the functions of the ports of 8255 are achieved by programming the bits of an internal register called
   a) Data bus control b) Read logic control
   c) Control word register d) None

2) The programmable timer device (8253) contains three independent _____ bit counters.
   a) 8 b) 16 c) 20 d) 32

3) The input clock frequency of 8251 is _____ times the TXC or RXC frequency.
   a) 10 b) 15 c) 20 d) 30

4) The mode of 8253 that is used to interrupt the processor by setting a suitable terminal count is
   a) mode 0 b) mode 1 c) mode 2 d) mode 3

5) The generation of square wave is possible using 8253 in the mode
   a) mode 1 b) mode 2 c) mode 3 d) mode 4

6) In control word register of 8253, if SC1 = 0 and SC0 = 1, then the counter selected is
   a) counter 0 b) counter 1 c) counter 2 d) none

7) 8253 counter pin OUT is to
   a) Indicates the counting process ends
   b) Start counting process
   c) Control counting process
   d) Input clock signal

8) Byte length, machine cycle and T-states required to execute the instruction STA address respectively is
   a) 2, 4, 13 b) 3, 4, 13 c) 3, 4, 15 d) None

9) _____ memory locations can be addressed directly by Intel 8085.
   a) 34 K b) 44 K c) 54 K d) 64 K

10) The number of software interrupts in 8085 is
   a) 5 b) 8 c) 9 d) 10

11) Identify the non-makeable interrupt in the following
   a) RST 4.5 (TRAP) b) RST 5.5 c) RST 6.5 d) RST 7.5

12) The status of S0 and S1 pins for memory read is
   a) 0, 0 b) 0, 1 c) 1, 0 d) 1,1

13) The contents of registers A and B after execution of following instructions are

   XRA A

   MVI B, 4 AH

   SUI 4FH

   ANA B

   HLT
   a) 05,4 A b) 4F, 00 c) B1, 4A d) 00, 4A

14) In an 8085 based system, the maximum number of input output devices can be connected using I/O mapped I/O method is
   a) 64 b) 512 c) 256 d) 65536

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SLR-VB – 176

Seat No.	

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS

Day and Date : Tuesday, 9-5-2017 Marks : 56

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

SECTION – I

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

   1) Draw and explain demultiplexing of address and data bus.

   2) Write ALP for arranging ten 8 bit number in reverse order with starting address 2000 H.

   3) Differentiate between hardware and software interrupt.

   4) How microprocessor differentiates between data and OPCODE ?

   5) Write a timing diagram of IN instruction.

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

   1) Interface 6K × 8 memory using 2K × 8. Assume starting address. Show the address range of each chip.

   2) Explain following decoding technique in detail.
      a) Absolute Decoding
      b) Partial decoding

   3) Explain the RIM and SIM instruction formats.

SECTION – II

4. Explain **any four** of the following : **(4×4=16)**

   1) Draw and explain working of weighted register type DAC.

   2) Compare 8085 and 8086.

   3) Write ALP to generate a square wave of 1 KHz frequency on OUT 1 pin of 8253. Assume clock frequency as 1 MHz, and address of CWR as $(0B)_H$.

   4) Draw architecture of 8086.

   5) Explain I/O operating modes of 8255.

5. Explain **any two** of the following : **(6×2=12)**

   1) Explain mode word format and command word format of 8251 in detail.

   2) Interface stepper motor to 8085 microprocessor. WALP to rotate stepper motor by one full revolution in clockwise direction stop.

   3) Interface DAC IC with 8085 (in memory mapped IO). Write a DAC program to generate square waveform.

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SLR-VB – 176

Seat No.	

Set R

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS

Day and Date : Tuesday, 9-5-2017 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) The status of S0 and S1 pins for memory read is
a) 0, 0 b) 0, 1 c) 1, 0 d) 1,1

2) The contents of registers A and B after execution of following instructions are

```
XRA A
MVI B, 4 AH
SUI 4FH
ANA B
HLT
```

a) 05, 4A b) 4F, 00 c) B1, 4A d) 00, 4A

3) In an 8085 based system, the maximum number of input output devices can be connected using I/O mapped I/O method is
a) 64 b) 512 c) 256 d) 65536

4) All the functions of the ports of 8255 are achieved by programming the bits of an internal register called
a) Data bus control b) Read logic control
c) Control word register d) None

5) The programmable timer device (8253) contains three independent _____ bit counters.
a) 8 b) 16 c) 20 d) 32

P.T.O.

6) The input clock frequency of 8251 is _____ times the TXC or RXC frequency.
   a) 10 b) 15 c) 20 d) 30

7) The mode of 8253 that is used to interrupt the processor by setting a suitable terminal count is
   a) mode 0 b) mode 1 c) mode 2 d) mode 3

8) The generation of square wave is possible using 8253 in the mode
   a) mode 1 b) mode 2 c) mode 3 d) mode 4

9) In control word register of 8253, if SC1 = 0 and SC0 = 1, then the counter selected is
   a) counter 0 b) counter 1 c) counter 2 d) none

10) 8253 counter pin OUT is to
   a) Indicates the counting process ends
   b) Start counting process
   c) Control counting process
   d) Input clock signal

11) Byte length, machine cycle and T-states required to execute the instruction STA address respectively is
   a) 2, 4, 13 b) 3, 4, 13 c) 3, 4, 15 d) None

12) _____ memory locations can be addressed directly by Intel 8085.
   a) 34 K b) 44 K c) 54 K d) 64 K

13) The number of software interrupts in 8085 is
   a) 5 b) 8 c) 9 d) 10

14) Identify the non-makeable interrupt in the following
   a) RST 4.5 (TRAP) b) RST 5.5 c) RST 6.5 d) RST 7.5

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SLR-VB – 176

Seat No.	

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS

Day and Date : Tuesday, 9-5-2017 Marks : 56

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

SECTION – I

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

   1) Draw and explain demultiplexing of address and data bus.

   2) Write ALP for arranging ten 8 bit number in reverse order with starting address 2000 H.

   3) Differentiate between hardware and software interrupt.

   4) How microprocessor differentiates between data and OPCODE ?

   5) Write a timing diagram of IN instruction.

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

   1) Interface 6K × 8 memory using 2K × 8. Assume starting address. Show the address range of each chip.

   2) Explain following decoding technique in detail.
      a) Absolute Decoding
      b) Partial decoding

   3) Explain the RIM and SIM instruction formats.

SECTION – II

4. Explain **any four** of the following : **(4×4=16)**

   1) Draw and explain working of weighted register type DAC.

   2) Compare 8085 and 8086.

   3) Write ALP to generate a square wave of 1 KHz frequency on OUT 1 pin of 8253. Assume clock frequency as 1 MHz, and address of CWR as $(0B)_H$.

   4) Draw architecture of 8086.

   5) Explain I/O operating modes of 8255.

5. Explain **any two** of the following : **(6×2=12)**

   1) Explain mode word format and command word format of 8251 in detail.

   2) Interface stepper motor to 8085 microprocessor. WALP to rotate stepper motor by one full revolution in clockwise direction stop.

   3) Interface DAC IC with 8085 (in memory mapped IO). Write a DAC program to generate square waveform.

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SLR-VB – 176

Seat No.	

Set **S**

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS

Day and Date : Tuesday, 9-5-2017 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) The input clock frequency of 8251 is _____ times the TXC or RXC frequency.
a) 10 b) 15 c) 20 d) 30

2) The mode of 8253 that is used to interrupt the processor by setting a suitable terminal count is
a) mode 0 b) mode 1 c) mode 2 d) mode 3

3) The generation of square wave is possible using 8253 in the mode
a) mode 1 b) mode 2 c) mode 3 d) mode 4

4) In control word register of 8253, if SC1 = 0 and SC0 = 1, then the counter selected is
a) counter 0 b) counter 1 c) counter 2 d) none

5) 8253 counter pin OUT is to
a) Indicates the counting process ends
b) Start counting process
c) Control counting process
d) Input clock signal

6) Byte length, machine cycle and T-states required to execute the instruction STA address respectively is
a) 2, 4, 13 b) 3, 4, 13 c) 3, 4, 15 d) None

7) _____ memory locations can be addressed directly by Intel 8085.
a) 34 K b) 44 K c) 54 K d) 64 K

8) The number of software interrupts in 8085 is
   a) 5 b) 8 c) 9 d) 10

9) Identify the non-makeable interrupt in the following
   a) RST 4.5 (TRAP) b) RST 5.5 c) RST 6.5 d) RST 7.5

10) The status of S0 and S1 pins for memory read is
   a) 0, 0 b) 0, 1 c) 1, 0 d) 1,1

11) The contents of registers A and B after execution of following instructions are

   XRA A

   MVI B, 4 AH

   SUI 4FH

   ANA B

   HLT
   a) 05, 4A b) 4F, 00 c) B1, 4A d) 00, 4A

12) In an 8085 based system, the maximum number of input output devices can be connected using I/O mapped I/O method is
   a) 64 b) 512 c) 256 d) 65536

13) All the functions of the ports of 8255 are achieved by programming the bits of an internal register called
   a) Data bus control b) Read logic control
   c) Control word register d) None

14) The programmable timer device (8253) contains three independent _____ bit counters.
   a) 8 b) 16 c) 20 d) 32

_____

SLR-VB – 176

Seat No.	

T.E. (E&TC) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS

Day and Date : Tuesday, 9-5-2017 Marks : 56

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

SECTION – I

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

   1) Draw and explain demultiplexing of address and data bus.

   2) Write ALP for arranging ten 8 bit number in reverse order with starting address 2000 H.

   3) Differentiate between hardware and software interrupt.

   4) How microprocessor differentiates between data and OPCODE ?

   5) Write a timing diagram of IN instruction.

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

   1) Interface 6K × 8 memory using 2K × 8. Assume starting address. Show the address range of each chip.

   2) Explain following decoding technique in detail.
      a) Absolute Decoding
      b) Partial decoding

   3) Explain the RIM and SIM instruction formats.

SECTION – II

4. Explain **any four** of the following : **(4×4=16)**

   1) Draw and explain working of weighted register type DAC.

   2) Compare 8085 and 8086.

   3) Write ALP to generate a square wave of 1 KHz frequency on OUT 1 pin of 8253. Assume clock frequency as 1 MHz, and address of CWR as $(0B)_H$.

   4) Draw architecture of 8086.

   5) Explain I/O operating modes of 8255.

5. Explain **any two** of the following : **(6×2=12)**

   1) Explain mode word format and command word format of 8251 in detail.

   2) Interface stepper motor to 8085 microprocessor. WALP to rotate stepper motor by one full revolution in clockwise direction stop.

   3) Interface DAC IC with 8085 (in memory mapped IO). Write a DAC program to generate square waveform.

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SLR-VB – 178

Seat No.	

Set P

T.E. (Electronics & Telecommunication Engg.) (Part – II) (New CGPA) Examination, 2017
RADAR AND MICROWAVE ENGG.

Day and Date : Monday, 15-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer : **14**

1) In IMPATT diode due to increased velocity of the electrons and holes result in additional electron and holes by knocking them out of the crystal structure is called as _____
A) avalanche breakdown B) impact ionization
C) reverse breakdown D) none of above

2) In n type GaAs having 10μm length has applied field of 3200 V/cm at the frequency of 10GHz then drift velocity of carriers is _____ m/sec.
A) 10 B) 100 C) 1000 D) None of these

3) Wave guides can carry
A) TE mode B) TM mode C) Mixed mode D) All of these

4) Phase velocity X Group Velocity = _____ (if c = free space velocity).
A) c B) $\sqrt{c}$ C) c^2 D) none of these

5) In case of Matched load _____
A) Transmission is zero B) Reflection is zero
C) Reflection is unity D) Transmission is equal to reflection

6) Circulator and Isolator works on the principle of _____
A) Faraday's rod B) Faraday's Rotation
C) Reciprocity theorem D) None of these

P.T.O.

7) E-plane Tee is called _____
   A) Current divider B) Power device
   C) 3 dB splitter D) Reciprocal device

8) _____ type radar cannot determine range of the moving target.
   A) Pulsed radar B) Modulated CW radar
   C) Unmodulated CW radar D) None of these

9) TWT is a
   A) Narrow band oscillator B) Broad Band Oscillator
   C) Narrow band amplifier D) Broad Band amplifier

10) If 'R_{max}' is doubled then 'Pt' is increase by _____ times.
   A) 2 B) 4 C) 8 D) 16

11) In zero mode of Magnetron following is true.
   A) Alternate anode cavities are having phase difference of 2π
   B) No magnetic field is present but RF is applied
   C) No RF field but magnetic field is applied
   D) No RF and no magnetic field is applied

12) The power between 10 mW – 1 W can be measured by _____ technique.
   A) Balometer B) Thermister
   C) Calorimetric D) Calorimetric wattmeter

13) VSWR > 10 can be measured accurately by
   A) Ratio of V_{max}/V_{min} B) Double Minima Method
   C) RF Substitution Method D) All of the above

14) In 8 cavity cylindrical Magnetron has _____ usable modes of resonance, if zero mode is excluded.
   A) 3 B) 8 C) 5 D) 4

_____

SLR-VB – 178

Seat No.	

T.E. (Electronics & Telecommunication Engg.) (Part – II) (New CGPA) Examination, 2017
RADAR AND MICROWAVE ENGG.

Day and Date : Monday, 15-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any three** : **(3×4=12)**
   1) Derive reflection coefficient and transmission coefficient equations for transmission line.
   2) With a neat diagram explain the method for measurement of unknown impedance using magic TEE.
   3) Draw a neat sketch and explain working of IMPATT diode.
   4) A rectangular waveguide has dimensions 2 cm × 4.5 cm internally with 9 GHz signal propagated in it. Find the characteristic wave impedance for TE dominant mode.
   5) Derive 'S' matrix for directional coupler.

3. Attempt **any two** : **(2×8=16)**
   a) Draw a neat sketch of Isolator. With the help of phasor diagram explain its working.
   b) The Primary constants of a cable are R = 80 Ω/km, L = 2 mH/km, G = 0.3 μ ℧/km, C = 0.07 mF/km. Calculate following parameters at 500 Hz.
      i) Characteristic impedance
      ii) Propagation Constant
      iii) Attenuation over 3km in decibels
      iv) Phase velocity in km/sec.
   c) Derive field component equations for rectangular waveguide assume the wave is propagating in z direction.

SECTION – II

4. Attempt **any three** : **(3×4=12)**
   1) Explain the method for measurement of VSWR by double minima method.
   2) Derive efficiency for Reflex Klystron.
   3) What is mode jumping ? How it is avoided in case of Magnetron ?
   4) Draw and explain MTI radar.
   5) Explain the method for measurement of impedance using reflectometer.

5. Attempt **any two** : **(2×8=16)**
   a) Derive Radar Range equation.
   b) X band pulsed 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 :
      i) Cyclotron angular frequency
      ii) Hull's cut-off voltage
      iii) Cut-off magnetic flux density for given anode voltage.

   c) Derive Velocity modulation equation for two cavity klystron amplifier.

SLR-VB – 178

Seat No.	

Set Q

T.E. (Electronics & Telecommunication Engg.) (Part – II) (New CGPA) Examination, 2017
RADAR AND MICROWAVE ENGG.

Day and Date : Monday, 15-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer : **14**

1) _____ type radar cannot determine range of the moving target.
A) Pulsed radar B) Modulated CW radar
C) Unmodulated CW radar D) None of these

2) TWT is a
A) Narrow band oscillator B) Broad Band Oscillator
C) Narrow band amplifier D) Broad Band amplifier

3) If 'R_{max}' is doubled then 'Pt' is increase by _____ times.
A) 2 B) 4 C) 8 D) 16

4) In zero mode of Magnetron following is true.
A) Alternate anode cavities are having phase difference of 2π
B) No magnetic field is present but RF is applied
C) No RF field but magnetic field is applied
D) No RF and no magnetic field is applied

5) The power between 10 mW – 1 W can be measured by _____ technique.
A) Balometer B) Thermister
C) Calorimetric D) Calorimetric wattmeter

6) VSWR > 10 can be measured accurately by
A) Ratio of V_{max}/V_{min} B) Double Minima Method
C) RF Substitution Method D) All of the above

P.T.O.

7) In 8 cavity cylindrical Magnetron has _____ usable modes of resonance, if zero mode is excluded.
   A) 3 B) 8 C) 5 D) 4

8) In IMPATT diode due to increased velocity of the electrons and holes result in additional electron and holes by knocking them out of the crystal structure is called as _____
   A) avalanche breakdown B) impact ionization
   C) reverse breakdown D) none of above

9) In n type GaAs having $10\mu m$ length has applied field of 3200 V/cm at the frequency of 10GHz then drift velocity of carriers is _____ m/sec.
   A) 10 B) 100 C) 1000 D) None of these

10) Wave guides can carry
   A) TE mode B) TM mode C) Mixed mode D) All of these

11) Phase velocity X Group Velocity = _____ (if c = free space velocity).
   A) c B) $\sqrt{c}$ C) c^2 D) none of these

12) In case of Matched load _____
   A) Transmission is zero B) Reflection is zero
   C) Reflection is unity D) Transmission is equal to reflection

13) Circulator and Isolator works on the principle of _____
   A) Faraday's rod B) Faraday's Rotation
   C) Reciprocity theorem D) None of these

14) E-plane Tee is called _____
   A) Current divider B) Power device
   C) 3 dB splitter D) Reciprocal device

_____

SLR-VB – 178

Seat No.	

T.E. (Electronics & Telecommunication Engg.) (Part – II) (New CGPA) Examination, 2017
RADAR AND MICROWAVE ENGG.

Day and Date : Monday, 15-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any three** : **(3×4=12)**
   1) Derive reflection coefficient and transmission coefficient equations for transmission line.
   2) With a neat diagram explain the method for measurement of unknown impedance using magic TEE.
   3) Draw a neat sketch and explain working of IMPATT diode.
   4) A rectangular waveguide has dimensions 2 cm × 4.5 cm internally with 9 GHz signal propagated in it. Find the characteristic wave impedance for TE dominant mode.
   5) Derive 'S' matrix for directional coupler.

3. Attempt **any two** : **(2×8=16)**
   a) Draw a neat sketch of Isolator. With the help of phasor diagram explain its working.
   b) The Primary constants of a cable are R = 80 Ω/km, L = 2 mH/km, G = 0.3 μ ℧/km, C = 0.07 mF/km. Calculate following parameters at 500 Hz.
      i) Characteristic impedance
      ii) Propagation Constant
      iii) Attenuation over 3km in decibels
      iv) Phase velocity in km/sec.
   c) Derive field component equations for rectangular waveguide assume the wave is propagating in z direction.

SECTION – II

4. Attempt **any three** : **(3×4=12)**
   1) Explain the method for measurement of VSWR by double minima method.
   2) Derive efficiency for Reflex Klystron.
   3) What is mode jumping ? How it is avoided in case of Magnetron ?
   4) Draw and explain MTI radar.
   5) Explain the method for measurement of impedance using reflectometer.

5. Attempt **any two** : **(2×8=16)**
   a) Derive Radar Range equation.
   b) X band pulsed 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 :
      i) Cyclotron angular frequency
      ii) Hull's cut-off voltage
      iii) Cut-off magnetic flux density for given anode voltage.

   c) Derive Velocity modulation equation for two cavity klystron amplifier.

SLR-VB – 178

Seat No.	

Set **R**

T.E. (Electronics & Telecommunication Engg.) (Part – II) (New CGPA) Examination, 2017
RADAR AND MICROWAVE ENGG.

Day and Date : Monday, 15-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer : **14**

1) In case of Matched load _____
   A) Transmission is zero B) Reflection is zero
   C) Reflection is unity D) Transmission is equal to reflection

2) Circulator and Isolator works on the principle of _____
   A) Faraday's rod B) Faraday's Rotation
   C) Reciprocity theorem D) None of these

3) E-plane Tee is called _____
   A) Current divider B) Power device
   C) 3 dB splitter D) Reciprocal device

4) _____ type radar cannot determine range of the moving target.
   A) Pulsed radar B) Modulated CW radar
   C) Unmodulated CW radar D) None of these

5) TWT is a
   A) Narrow band oscillator B) Broad Band Oscillator
   C) Narrow band amplifier D) Broad Band amplifier

6) If 'R_{max}' is doubled then 'Pt' is increase by _____ times.
   A) 2 B) 4 C) 8 D) 16

7) In zero mode of Magnetron following is true.
   A) Alternate anode cavities are having phase difference of 2π
   B) No magnetic field is present but RF is applied
   C) No RF field but magnetic field is applied
   D) No RF and no magnetic field is applied

8) The power between 10 mW – 1 W can be measured by _____ technique.
   A) Balometer B) Thermister
   C) Calorimetric D) Calorimetric wattmeter

9) VSWR > 10 can be measured accurately by
   A) Ratio of V_{max}/V_{min} B) Double Minima Method
   C) RF Substitution Method D) All of the above

10) In 8 cavity cylindrical Magnetron has _____ usable modes of resonance, if zero mode is excluded.
   A) 3 B) 8 C) 5 D) 4

11) In IMPATT diode due to increased velocity of the electrons and holes result in additional electron and holes by knocking them out of the crystal structure is called as _____
   A) avalanche breakdown B) impact ionization
   C) reverse breakdown D) none of above

12) In n type GaAs having $10\mu m$ length has applied field of 3200 V/cm at the frequency of 10GHz then drift velocity of carriers is _____ m/sec.
   A) 10 B) 100 C) 1000 D) None of these

13) Wave guides can carry
   A) TE mode B) TM mode C) Mixed mode D) All of these

14) Phase velocity X Group Velocity = _____ (if c = free space velocity).
   A) c B) $\sqrt{c}$ C) c^2 D) none of these

_____

SLR-VB – 178

Seat No.	

T.E. (Electronics & Telecommunication Engg.) (Part – II) (New CGPA) Examination, 2017
RADAR AND MICROWAVE ENGG.

Day and Date : Monday, 15-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any three** : **(3×4=12)**
   1) Derive reflection coefficient and transmission coefficient equations for transmission line.
   2) With a neat diagram explain the method for measurement of unknown impedance using magic TEE.
   3) Draw a neat sketch and explain working of IMPATT diode.
   4) A rectangular waveguide has dimensions 2 cm × 4.5 cm internally with 9 GHz signal propagated in it. Find the characteristic wave impedance for TE dominant mode.
   5) Derive 'S' matrix for directional coupler.

3. Attempt **any two** : **(2×8=16)**
   a) Draw a neat sketch of Isolator. With the help of phasor diagram explain its working.
   b) The Primary constants of a cable are R = 80 Ω/km, L = 2 mH/km, G = 0.3 μ ℧/km, C = 0.07 mF/km. Calculate following parameters at 500 Hz.
      i) Characteristic impedance
      ii) Propagation Constant
      iii) Attenuation over 3km in decibels
      iv) Phase velocity in km/sec.
   c) Derive field component equations for rectangular waveguide assume the wave is propagating in z direction.

SECTION – II

4. Attempt **any three** : **(3×4=12)**
   1) Explain the method for measurement of VSWR by double minima method.
   2) Derive efficiency for Reflex Klystron.
   3) What is mode jumping ? How it is avoided in case of Magnetron ?
   4) Draw and explain MTI radar.
   5) Explain the method for measurement of impedance using reflectometer.

5. Attempt **any two** : **(2×8=16)**
   a) Derive Radar Range equation.
   b) X band pulsed 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 :
      i) Cyclotron angular frequency
      ii) Hull's cut-off voltage
      iii) Cut-off magnetic flux density for given anode voltage.

   c) Derive Velocity modulation equation for two cavity klystron amplifier.

SLR-VB – 178

Seat No.	

Set S

T.E. (Electronics & Telecommunication Engg.) (Part – II) (New CGPA) Examination, 2017
RADAR AND MICROWAVE ENGG.

Day and Date : Monday, 15-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer : **14**

1) If 'R_{max}' is doubled then 'Pt' is increase by _____ times.
A) 2 B) 4 C) 8 D) 16

2) In zero mode of Magnetron following is true.
A) Alternate anode cavities are having phase difference of 2π
B) No magnetic field is present but RF is applied
C) No RF field but magnetic field is applied
D) No RF and no magnetic field is applied

3) The power between 10 mW – 1 W can be measured by _____ technique.
A) Balometer B) Thermister
C) Calorimetric D) Calorimetric wattmeter

4) VSWR > 10 can be measured accurately by
A) Ratio of V_{max}/V_{min} B) Double Minima Method
C) RF Substitution Method D) All of the above

5) In 8 cavity cylindrical Magnetron has _____ usable modes of resonance, if zero mode is excluded.
A) 3 B) 8 C) 5 D) 4

P.T.O.

6) In IMPATT diode due to increased velocity of the electrons and holes result in additional electron and holes by knocking them out of the crystal structure is called as _____
   A) avalanche breakdown B) impact ionization
   C) reverse breakdown D) none of above

7) In n type GaAs having 10μm length has applied field of 3200 V/cm at the frequency of 10GHz then drift velocity of carriers is _____ m/sec.
   A) 10 B) 100 C) 1000 D) None of these

8) Wave guides can carry
   A) TE mode B) TM mode C) Mixed mode D) All of these

9) Phase velocity X Group Velocity = _____ (if c = free space velocity).
   A) c B) $\sqrt{c}$ C) c^2 D) none of these

10) In case of Matched load _____
   A) Transmission is zero B) Reflection is zero
   C) Reflection is unity D) Transmission is equal to reflection

11) Circulator and Isolator works on the principle of _____
   A) Faraday's rod B) Faraday's Rotation
   C) Reciprocity theorem D) None of these

12) E-plane Tee is called _____
   A) Current divider B) Power device
   C) 3 dB splitter D) Reciprocal device

13) _____ type radar cannot determine range of the moving target.
   A) Pulsed radar B) Modulated CW radar
   C) Unmodulated CW radar D) None of these

14) TWT is a
   A) Narrow band oscillator B) Broad Band Oscillator
   C) Narrow band amplifier D) Broad Band amplifier

_____

SLR-VB – 178

Seat No.	

T.E. (Electronics & Telecommunication Engg.) (Part – II) (New CGPA) Examination, 2017
RADAR AND MICROWAVE ENGG.

Day and Date : Monday, 15-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any three** : **(3×4=12)**
   1) Derive reflection coefficient and transmission coefficient equations for transmission line.
   2) With a neat diagram explain the method for measurement of unknown impedance using magic TEE.
   3) Draw a neat sketch and explain working of IMPATT diode.
   4) A rectangular waveguide has dimensions 2 cm × 4.5 cm internally with 9 GHz signal propagated in it. Find the characteristic wave impedance for TE dominant mode.
   5) Derive 'S' matrix for directional coupler.

3. Attempt **any two** : **(2×8=16)**
   a) Draw a neat sketch of Isolator. With the help of phasor diagram explain its working.
   b) The Primary constants of a cable are R = 80 Ω/km, L = 2 mH/km, G = 0.3 μ ℧/km, C = 0.07 mF/km. Calculate following parameters at 500 Hz.
      i) Characteristic impedance
      ii) Propagation Constant
      iii) Attenuation over 3km in decibels
      iv) Phase velocity in km/sec.
   c) Derive field component equations for rectangular waveguide assume the wave is propagating in z direction.

SECTION – II

4. Attempt **any three** : **(3×4=12)**
   1) Explain the method for measurement of VSWR by double minima method.
   2) Derive efficiency for Reflex Klystron.
   3) What is mode jumping ? How it is avoided in case of Magnetron ?
   4) Draw and explain MTI radar.
   5) Explain the method for measurement of impedance using reflectometer.

5. Attempt **any two** : **(2×8=16)**
   a) Derive Radar Range equation.
   b) X band pulsed 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 :
      i) Cyclotron angular frequency
      ii) Hull's cut-off voltage
      iii) Cut-off magnetic flux density for given anode voltage.

   c) Derive Velocity modulation equation for two cavity klystron amplifier.

SLR-VB – 179

Seat No.	

Set P

T.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS AND APPLICATIONS (New)

Day and Date : Wednesday, 17-5-2017 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, ***if*** *required.*
4) Figures to the ***right*** *indicate* ***full*** *marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) In 8051, for external memory interfacing the required address and data lines are provided by _____ ports.
   a) P0 and P1 b) P1 and P2 c) P0 and P2 d) P1 and P3

2) What is the duration of one machine cycle in 8051, if a crystal of 11.0592 MHz is used ?
   a) 1.085 uSec b) 1.085 mSec c) 12 uSec d) 12 mSec

3) GATE bit in TCON register is used to
   a) To decide overflow condition of respective timer
   b) To decide mode of respective timer
   c) To decide hardware control on the operation of respective timer
   d) None of the above

4) With a crystal of 11.0592 MHz, TH1 must be loaded with _____ for a baud rate of 9600.
   a) FA H b) FD H c) FE H d) E9 H

5) AC flag in 8051 is set when
   a) Timer-0 overflow occurs
   b) 8^{th} Bit of serial data is received
   c) 8^{th} Bit of serial data is transmitted
   d) Carry generated from D_3 bit to D_4 bit during addition

P.T.O.

6) What will be contents of SP after execution of following set of instructions ?

```
MOV SP, # 07
PUSH 0
PUSH 1
POP 0
PUSH PSW
```

a) 08 H b) 09 H c) 07 H d) 0A H

7) Which bits in interrupt Enable register are used to set Serial interrupt ?
a) ET0, ES b) ET1, ES c) EA, ES d) EX0, ES

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

9) It is possible to transfer the data to the LCD from a port using only 4 port lines.
a) Yes b) No
c) Both a and b d) None of the above

10) 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) false for all interrupts
c) true for all interrupt d) none of these

11) 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

12) Sink and source capability of PIC is
a) 20 mA b) 25 mA c) 40 mA d) 50 mA

13) PIC has power saving _____ mode.
a) SLEEP b) standby c) power up d) power down

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

_____

SLR-VB – 179

Seat No.	

T.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS AND APPLICATIONS (New)

Day and Date : Wednesday, 17-5-2017 Marks : 56

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

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

2) Assume suitable data, ***if*** *required.*

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

2. Solve **any four** : **(4×3=12)**

a) Differentiate between CISC and RISC architectures.

b) Write an ALP to add eight 8-bit numbers stored in internal data memory from address 10 H onwards. Store the result of addition in register R0 and R1 of Bank 0.

c) Explain IP register in 8051.

d) Explain following instructions

1) ACALL <Address>

2) LCALL <Addresss>

3) DJNZ <Reg>, <Rel_Address>

e) Explain the pins of a 16 × 2 alpha numeric LCD.

3. Solve **any two** : **(2×8=16)**

a) Explain the construction and working principle of a matrix keypad. Also interface it with 8051 microcontroller and explain the concept of reading a key, key debounce using a flowchart and interfacing diagram.

b) Explain SFRs associated with Timers in 8051.

c) Interface 16 × 8 Program ROM and 16 × 8 Data RAM to 8051. Write an ALP to find largest number from an array of seven numbers stored in external data RAM locations 4000 h – 4007 h.

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

   a) Explain the logical instructions named as XORLW, XORWF, IORLW and IORWF in detail.

   b) With neat diagram explain timer1 and its control register.

   c) Explain how A/D conversion is carried in PIC 16f877.

   d) Differentiate between CISC and RISC.

5. Answer **any two** : **(2×8=16)**

   1) Draw and explain block diagram of PIC 16f877.

   2) Write a short note on brown out reset and also explain PCON, INTCON and STATUS registers of PIC.

   3) Explain with neat diagram program memory and data memory organization of PIC.

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SLR-VB – 179

Seat No.	

Set Q

T.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS AND APPLICATIONS (New)

Day and Date : Wednesday, 17-5-2017 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, ***if*** *required.*
4) Figures to the ***right*** *indicate* ***full*** *marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

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

2) It is possible to transfer the data to the LCD from a port using only 4 port lines.
a) Yes b) No
c) Both a and b d) None of the above

3) 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) false for all interrupts
c) true for all interrupt d) none of these

4) 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

5) Sink and source capability of PIC is
a) 20 mA b) 25 mA c) 40 mA d) 50 mA

6) PIC has power saving _____ mode.
a) SLEEP b) standby c) power up d) power down

P.T.O.

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

8) In 8051, for external memory interfacing the required address and data lines are provided by _____ ports.
   a) P0 and P1 b) P1 and P2 c) P0 and P2 d) P1 and P3

9) What is the duration of one machine cycle in 8051, if a crystal of 11.0592 MHz is used ?
   a) 1.085 uSec b) 1.085 mSec c) 12 uSec d) 12 mSec

10) GATE bit in TCON register is used to
   a) To decide overflow condition of respective timer
   b) To decide mode of respective timer
   c) To decide hardware control on the operation of respective timer
   d) None of the above

11) With a crystal of 11.0592 MHz, TH1 must be loaded with _____ for a baud rate of 9600.
   a) FA H b) FD H c) FE H d) E9 H

12) AC flag in 8051 is set when
   a) Timer-0 overflow occurs
   b) 8^{th} Bit of serial data is received
   c) 8^{th} Bit of serial data is transmitted
   d) Carry generated from D_3 bit to D_4 bit during addition

13) What will be contents of SP after execution of following set of instructions ?

```
MOV SP, # 07
PUSH 0
PUSH 1
POP 0
PUSH PSW
```

   a) 08 H b) 09 H c) 07 H d) 0A H

14) Which bits in interrupt Enable register are used to set Serial interrupt ?
   a) ET0, ES b) ET1, ES c) EA, ES d) EX0, ES

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SLR-VB – 179

Seat No.	

T.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS AND APPLICATIONS (New)

Day and Date : Wednesday, 17-5-2017 Marks : 56

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

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

2) Assume suitable data, ***if*** *required.*

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

2. Solve **any four** : **(4×3=12)**

a) Differentiate between CISC and RISC architectures.

b) Write an ALP to add eight 8-bit numbers stored in internal data memory from address 10 H onwards. Store the result of addition in register R0 and R1 of Bank 0.

c) Explain IP register in 8051.

d) Explain following instructions

1) ACALL <Address>

2) LCALL <Addresss>

3) DJNZ <Reg>, <Rel_Address>

e) Explain the pins of a 16 × 2 alpha numeric LCD.

3. Solve **any two** : **(2×8=16)**

a) Explain the construction and working principle of a matrix keypad. Also interface it with 8051 microcontroller and explain the concept of reading a key, key debounce using a flowchart and interfacing diagram.

b) Explain SFRs associated with Timers in 8051.

c) Interface 16 × 8 Program ROM and 16 × 8 Data RAM to 8051. Write an ALP to find largest number from an array of seven numbers stored in external data RAM locations 4000 h – 4007 h.

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

   a) Explain the logical instructions named as XORLW, XORWF, IORLW and IORWF in detail.

   b) With neat diagram explain timer1 and its control register.

   c) Explain how A/D conversion is carried in PIC 16f877.

   d) Differentiate between CISC and RISC.

5. Answer **any two** : **(2×8=16)**

   1) Draw and explain block diagram of PIC 16f877.

   2) Write a short note on brown out reset and also explain PCON, INTCON and STATUS registers of PIC.

   3) Explain with neat diagram program memory and data memory organization of PIC.

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SLR-VB – 179

Seat No.	

Set R

T.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS AND APPLICATIONS (New)

Day and Date : Wednesday, 17-5-2017 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, ***if*** *required.*
4) Figures to the ***right*** *indicate* ***full*** *marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) AC flag in 8051 is set when
   a) Timer-0 overflow occurs
   b) 8^{th} Bit of serial data is received
   c) 8^{th} Bit of serial data is transmitted
   d) Carry generated from D_3 bit to D_4 bit during addition

2) What will be contents of SP after execution of following set of instructions ?

```
MOV SP, # 07
PUSH 0
PUSH 1
POP 0
PUSH PSW
```

   a) 08 H b) 09 H c) 07 H d) 0A H

3) Which bits in interrupt Enable register are used to set Serial interrupt ?
   a) ET0, ES b) ET1, ES c) EA, ES d) EX0, ES

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

P.T.O.

5) It is possible to transfer the data to the LCD from a port using only 4 port lines.
   a) Yes b) No
   c) Both a and b d) None of the above

6) 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) false for all interrupts
   c) true for all interrupt d) none of these

7) 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

8) Sink and source capability of PIC is
   a) 20 mA b) 25 mA c) 40 mA d) 50 mA

9) PIC has power saving _____ mode.
   a) SLEEP b) standby c) power up d) power down

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

11) In 8051, for external memory interfacing the required address and data lines are provided by _____ ports.
   a) P0 and P1 b) P1 and P2 c) P0 and P2 d) P1 and P3

12) What is the duration of one machine cycle in 8051, if a crystal of 11.0592 MHz is used ?
   a) 1.085 uSec b) 1.085 mSec c) 12 uSec d) 12 mSec

13) GATE bit in TCON register is used to
   a) To decide overflow condition of respective timer
   b) To decide mode of respective timer
   c) To decide hardware control on the operation of respective timer
   d) None of the above

14) With a crystal of 11.0592 MHz, TH1 must be loaded with _____ for a baud rate of 9600.
   a) FA H b) FD H c) FE H d) E9 H

_____

SLR-VB – 179

Seat No.	

T.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS AND APPLICATIONS (New)

Day and Date : Wednesday, 17-5-2017 Marks : 56

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

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

2) Assume suitable data, ***if*** *required.*

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

2. Solve **any four** : **(4×3=12)**

a) Differentiate between CISC and RISC architectures.

b) Write an ALP to add eight 8-bit numbers stored in internal data memory from address 10 H onwards. Store the result of addition in register R0 and R1 of Bank 0.

c) Explain IP register in 8051.

d) Explain following instructions

1) ACALL <Address>

2) LCALL <Addresss>

3) DJNZ <Reg>, <Rel_Address>

e) Explain the pins of a 16 × 2 alpha numeric LCD.

3. Solve **any two** : **(2×8=16)**

a) Explain the construction and working principle of a matrix keypad. Also interface it with 8051 microcontroller and explain the concept of reading a key, key debounce using a flowchart and interfacing diagram.

b) Explain SFRs associated with Timers in 8051.

c) Interface 16 × 8 Program ROM and 16 × 8 Data RAM to 8051. Write an ALP to find largest number from an array of seven numbers stored in external data RAM locations 4000 h – 4007 h.

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

   a) Explain the logical instructions named as XORLW, XORWF, IORLW and IORWF in detail.

   b) With neat diagram explain timer1 and its control register.

   c) Explain how A/D conversion is carried in PIC 16f877.

   d) Differentiate between CISC and RISC.

5. Answer **any two** : **(2×8=16)**

   1) Draw and explain block diagram of PIC 16f877.

   2) Write a short note on brown out reset and also explain PCON, INTCON and STATUS registers of PIC.

   3) Explain with neat diagram program memory and data memory organization of PIC.

———————————

SLR-VB – 179

Seat No.	

Set S

T.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS AND APPLICATIONS (New)

Day and Date : Wednesday, 17-5-2017 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, ***if*** *required.*
4) Figures to the ***right*** *indicate* ***full*** *marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) 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) false for all interrupts
   c) true for all interrupt d) none of these

2) 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

3) Sink and source capability of PIC is
   a) 20 mA b) 25 mA c) 40 mA d) 50 mA

4) PIC has power saving _____ mode.
   a) SLEEP b) standby c) power up d) power down

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

6) In 8051, for external memory interfacing the required address and data lines are provided by _____ ports.
   a) P0 and P1 b) P1 and P2 c) P0 and P2 d) P1 and P3

P.T.O.

7) What is the duration of one machine cycle in 8051, if a crystal of 11.0592 MHz is used ?
   a) 1.085 uSec b) 1.085 mSec c) 12 uSec d) 12 mSec

8) GATE bit in TCON register is used to
   a) To decide overflow condition of respective timer
   b) To decide mode of respective timer
   c) To decide hardware control on the operation of respective timer
   d) None of the above

9) With a crystal of 11.0592 MHz, TH1 must be loaded with _____ for a baud rate of 9600.
   a) FA H b) FD H c) FE H d) E9 H

10) AC flag in 8051 is set when
   a) Timer-0 overflow occurs
   b) 8^{th} Bit of serial data is received
   c) 8^{th} Bit of serial data is transmitted
   d) Carry generated from D_3 bit to D_4 bit during addition

11) What will be contents of SP after execution of following set of instructions ?

```
MOV SP, # 07
PUSH 0
PUSH 1
POP 0
PUSH PSW
```

   a) 08 H b) 09 H c) 07 H d) 0A H

12) Which bits in interrupt Enable register are used to set Serial interrupt ?
   a) ET0, ES b) ET1, ES c) EA, ES d) EX0, ES

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

14) It is possible to transfer the data to the LCD from a port using only 4 port lines.
   a) Yes b) No
   c) Both a and b d) None of the above

_____

SLR-VB – 179

Seat No.	

T.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS AND APPLICATIONS (New)

Day and Date : Wednesday, 17-5-2017 Marks : 56

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

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

2) Assume suitable data, ***if*** *required.*

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

2. Solve **any four** : **(4×3=12)**

a) Differentiate between CISC and RISC architectures.

b) Write an ALP to add eight 8-bit numbers stored in internal data memory from address 10 H onwards. Store the result of addition in register R0 and R1 of Bank 0.

c) Explain IP register in 8051.

d) Explain following instructions

1) ACALL <Address>

2) LCALL <Addresss>

3) DJNZ <Reg>, <Rel_Address>

e) Explain the pins of a 16 × 2 alpha numeric LCD.

3. Solve **any two** : **(2×8=16)**

a) Explain the construction and working principle of a matrix keypad. Also interface it with 8051 microcontroller and explain the concept of reading a key, key debounce using a flowchart and interfacing diagram.

b) Explain SFRs associated with Timers in 8051.

c) Interface 16 × 8 Program ROM and 16 × 8 Data RAM to 8051. Write an ALP to find largest number from an array of seven numbers stored in external data RAM locations 4000 h – 4007 h.

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

   a) Explain the logical instructions named as XORLW, XORWF, IORLW and IORWF in detail.

   b) With neat diagram explain timer1 and its control register.

   c) Explain how A/D conversion is carried in PIC 16f877.

   d) Differentiate between CISC and RISC.

5. Answer **any two** : **(2×8=16)**

   1) Draw and explain block diagram of PIC 16f877.

   2) Write a short note on brown out reset and also explain PCON, INTCON and STATUS registers of PIC.

   3) Explain with neat diagram program memory and data memory organization of PIC.

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SLR-VB – 180

Seat No.	

Set **P**

T.E. (E & TC) (Part – II) (New CGPA) Examination, 2017
ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date : Friday, 19-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

***Note** : 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 suitable data if **necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) As the breakdown voltage reached, the DIAC exhibits
   a) Negative resistance characteristics
   b) Goes into avalanche condition
   c) Voltage drop snaps back
   d) All of these

2) An SCR can be used
   a) as static conductor
   b) for power control
   c) for speed control of dc shunt motor
   d) all of these

3) In reverse blocking mode of a thyristor
   a) junction J2 is in reverse bias and J1, J3 is in forward bias
   b) junction J3 is in forward bias and J1, J2 is in reverse bias
   c) junction J1, J3 is in reverse bias and J2 is in forward bias
   d) junction J1 and J2 is in forward bias and J3 is in reverse bias

4) In a $P_1N_1P_2N_2$ thyristor which layer is less doped ?
   a) P_1 b) N_1 c) P_2 d) N_2

5) Delay time is defined by the interval when
   a) gate current increases from 90% to 100% of its final value
   b) anode current reaches 10% from forward leakage current
   c) anode voltage drops from 100% to 90% of its actual value
   d) all of these

P.T.O.

6) In a PLL frequency synthesizer, a value of divide-by-N network varies from 1 to 100 in a single steps increment with f_{in} = 0.1 KHz. What is the value of synthesizer output ?
   a) 100 Hz to 10000 Hz in 0.1 KHz increments
   b) 1 KHz to 100 KHz in 1 KHz increments
   c) 1 Hz to 100 Hz in 1 Hz increments
   d) 1 KHz to 999 KHz in 100 Hz increments

7) The process of turning off of a conducting SCR is known as
   a) SCR turn off time
   b) Circuit turn off time
   c) Commutation
   d) Conduction

8) Which of the following temperature sensor has sensitivity 10 mv/°C ?
   a) LM 35
   b) J – type thermocouple
   c) PT 100
   d) None of above

9) In XR2240 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

10) In ON – OFF controller, error voltage (V_e) is given by
   a) $V_e = V_{SP} + V_{PV}$
   b) $V_e = V_{PV} - V_{SP}$
   c) $V_e = V_{SP} - V_{PV}$
   d) $V_e = V_{PV} + V_{SP}$

11) The number of displays required to measure ratio of two frequencies up to 1000 using IC 74C926 are
   a) 3 b) 4 c) 5 d) 6

12) A high level signal on display select input of IC 74C926, displays output of
   a) Latches
   b) Counters
   c) Both a) and b)
   d) None of these

13) For input voltage range 0 – 4V, t_2 = 4000, required DVM display is
   a) 2 digit b) 3 digit c) $3\frac{1}{2}$ digit d) $3\frac{3}{4}$ digit

14) The last instruction on the rung must be an
   a) Input instruction
   b) Output instruction
   c) Either a) or b)
   d) All of these

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SLR-VB – 180

Seat No.	

T.E. (E & TC) (Part – II) (New CGPA) Examination, 2017
ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date : Friday, 19-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

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

1) Explain two transistor analogy of SCR.
2) How does Class B type self commutation by an LC circuit turns off SCR ?
3) How AC power control for a fan regulator is achieved using DIAC and TRIAC ?
4) Write a note on Induction and dielectric heating.

III. Answer **any one** : **(8×1=8)**

1) With the help of circuit diagram and waveform explain single phase half wave controlled rectifier with inductive load. Derive the expressions for Average DC output voltage. What is the effect of free wheeling diode when connected across inductive load ?
2) With the help of block diagram explain the PLL IC LM 565. Using PLL IC 565, design and explain working of FSK demodulator.

IV. Design a frequency synthesizer to generate a frequency of 1 KHz to 999 KHz using IC CD 4046. Use 4.43 MHz crystal. **8**

SECTION – II

V. Solve **any three** : **(3×4=12)**

1) Draw and explain block diagram of IC 74C926.
2) Design a timer using XR2240 to generate a delay of 300 seconds in two sections.

3) Compare between Thermocouple and RTD.

4) Design a signal conditioning circuit to convert 0°C to 150°C in to 4mA to 20mA. Use PT 100.

VI. Solve **any one** : **(1×8=8)**

1) Draw and explain ladder diagram for bottle filling plant.

2) Design a frequency measurement setup to measure frequency up to 100 KHz with 0.1 Hz accuracy.

VII. Design a $3\frac{1}{2}$ digit DVM to measure V_{in} = 2V. Use 1 MHz clock. **8**

SLR-VB – 180

Seat No.	

Set Q

T.E. (E & TC) (Part – II) (New CGPA) Examination, 2017
ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date : Friday, 19-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

***Note** : 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 suitable data if **necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Which of the following temperature sensor has sensitivity 10 mv/°C ?
   a) LM 35 b) J – type thermocouple
   c) PT 100 d) None of above

2) In XR2240 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

3) In ON – OFF controller, error voltage (V_e) is given by
   a) $V_e = V_{SP} + V_{PV}$ b) $V_e = V_{PV} - V_{SP}$
   c) $V_e = V_{SP} - V_{PV}$ d) $V_e = V_{PV} + V_{SP}$

4) The number of displays required to measure ratio of two frequencies up to 1000 using IC 74C926 are
   a) 3 b) 4 c) 5 d) 6

5) A high level signal on display select input of IC 74C926, displays output of
   a) Latches b) Counters
   c) Both a) and b) d) None of these

6) For input voltage range 0 – 4V, t_2 = 4000, required DVM display is
   a) 2 digit b) 3 digit c) $3\frac{1}{2}$ digit d) $3\frac{3}{4}$ digit

7) The last instruction on the rung must be an
   a) Input instruction b) Output instruction
   c) Either a) or b) d) All of these

P.T.O.

8) As the breakdown voltage reached, the DIAC exhibits
   a) Negative resistance characteristics
   b) Goes into avalanche condition
   c) Voltage drop snaps back
   d) All of these

9) An SCR can be used
   a) as static conductor
   b) for power control
   c) for speed control of dc shunt motor
   d) all of these

10) In reverse blocking mode of a thyristor
   a) junction J2 is in reverse bias and J1, J3 is in forward bias
   b) junction J3 is in forward bias and J1, J2 is in reverse bias
   c) junction J1, J3 is in reverse bias and J2 is in forward bias
   d) junction J1 and J2 is in forward bias and J3 is in reverse bias

11) In a $P_1N_1P_2N_2$ thyristor which layer is less doped ?
   a) P_1 b) N_1 c) P_2 d) N_2

12) Delay time is defined by the interval when
   a) gate current increases from 90% to 100% of its final value
   b) anode current reaches 10% from forward leakage current
   c) anode voltage drops from 100% to 90% of its actual value
   d) all of these

13) In a PLL frequency synthesizer, a value of divide-by-N network varies from 1 to 100 in a single steps increment with f_{in} = 0.1 KHz. What is the value of synthesizer output ?
   a) 100 Hz to 10000 Hz in 0.1 KHz increments
   b) 1 KHz to 100 KHz in 1 KHz increments
   c) 1 Hz to 100 Hz in 1 Hz increments
   d) 1 KHz to 999 KHz in 100 Hz increments

14) The process of turning off of a conducting SCR is known as
   a) SCR turn off time b) Circuit turn off time
   c) Commutation d) Conduction

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SLR-VB – 180

Seat No.	

T.E. (E & TC) (Part – II) (New CGPA) Examination, 2017
ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date : Friday, 19-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

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

1) Explain two transistor analogy of SCR.
2) How does Class B type self commutation by an LC circuit turns off SCR ?
3) How AC power control for a fan regulator is achieved using DIAC and TRIAC ?
4) Write a note on Induction and dielectric heating.

III. Answer **any one** : **(8×1=8)**

1) With the help of circuit diagram and waveform explain single phase half wave controlled rectifier with inductive load. Derive the expressions for Average DC output voltage. What is the effect of free wheeling diode when connected across inductive load ?
2) With the help of block diagram explain the PLL IC LM 565. Using PLL IC 565, design and explain working of FSK demodulator.

IV. Design a frequency synthesizer to generate a frequency of 1 KHz to 999 KHz using IC CD 4046. Use 4.43 MHz crystal. **8**

SECTION – II

V. Solve **any three** : **(3×4=12)**

1) Draw and explain block diagram of IC 74C926.
2) Design a timer using XR2240 to generate a delay of 300 seconds in two sections.

3) Compare between Thermocouple and RTD.

4) Design a signal conditioning circuit to convert 0°C to 150°C in to 4mA to 20mA. Use PT 100.

VI. Solve **any one** : **(1×8=8)**

1) Draw and explain ladder diagram for bottle filling plant.

2) Design a frequency measurement setup to measure frequency up to 100 KHz with 0.1 Hz accuracy.

VII. Design a $3\frac{1}{2}$ digit DVM to measure V_{in} = 2V. Use 1 MHz clock. **8**

SLR-VB – 180

Seat No.	

Set **R**

T.E. (E & TC) (Part – II) (New CGPA) Examination, 2017
ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date : Friday, 19-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

***Note** : 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 suitable data if **necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Delay time is defined by the interval when
   a) gate current increases from 90% to 100% of its final value
   b) anode current reaches 10% from forward leakage current
   c) anode voltage drops from 100% to 90% of its actual value
   d) all of these

2) In a PLL frequency synthesizer, a value of divide-by-N network varies from 1 to 100 in a single steps increment with f_{in} = 0.1 KHz. What is the value of synthesizer output ?
   a) 100 Hz to 10000 Hz in 0.1 KHz increments
   b) 1 KHz to 100 KHz in 1 KHz increments
   c) 1 Hz to 100 Hz in 1 Hz increments
   d) 1 KHz to 999 KHz in 100 Hz increments

3) The process of turning off of a conducting SCR is known as
   a) SCR turn off time b) Circuit turn off time
   c) Commutation d) Conduction

4) Which of the following temperature sensor has sensitivity 10 mv/°C ?
   a) LM 35 b) J – type thermocouple
   c) PT 100 d) None of above

5) In XR2240 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

P.T.O.

6) In ON – OFF controller, error voltage (V_e) is given by
   a) $V_e = V_{SP} + V_{PV}$ b) $V_e = V_{PV} - V_{SP}$
   c) $V_e = V_{SP} - V_{PV}$ d) $V_e = V_{PV} + V_{SP}$

7) The number of displays required to measure ratio of two frequencies up to 1000 using IC 74C926 are
   a) 3 b) 4 c) 5 d) 6

8) A high level signal on display select input of IC 74C926, displays output of
   a) Latches b) Counters
   c) Both a) and b) d) None of these

9) For input voltage range 0 – 4V, t_2 = 4000, required DVM display is
   a) 2 digit b) 3 digit c) $3\frac{1}{2}$ digit d) $3\frac{3}{4}$ digit

10) The last instruction on the rung must be an
   a) Input instruction b) Output instruction
   c) Either a) or b) d) All of these

11) As the breakdown voltage reached, the DIAC exhibits
   a) Negative resistance characteristics
   b) Goes into avalanche condition
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12) An SCR can be used
   a) as static conductor
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13) In reverse blocking mode of a thyristor
   a) junction J2 is in reverse bias and J1, J3 is in forward bias
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   c) junction J1, J3 is in reverse bias and J2 is in forward bias
   d) junction J1 and J2 is in forward bias and J3 is in reverse bias

14) In a $P_1N_1P_2N_2$ thyristor which layer is less doped ?
   a) P_1 b) N_1 c) P_2 d) N_2

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SLR-VB – 180

Seat No.	

T.E. (E & TC) (Part – II) (New CGPA) Examination, 2017
ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date : Friday, 19-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

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

1) Explain two transistor analogy of SCR.
2) How does Class B type self commutation by an LC circuit turns off SCR ?
3) How AC power control for a fan regulator is achieved using DIAC and TRIAC ?
4) Write a note on Induction and dielectric heating.

III. Answer **any one** : **(8×1=8)**

1) With the help of circuit diagram and waveform explain single phase half wave controlled rectifier with inductive load. Derive the expressions for Average DC output voltage. What is the effect of free wheeling diode when connected across inductive load ?
2) With the help of block diagram explain the PLL IC LM 565. Using PLL IC 565, design and explain working of FSK demodulator.

IV. Design a frequency synthesizer to generate a frequency of 1 KHz to 999 KHz using IC CD 4046. Use 4.43 MHz crystal. **8**

SECTION – II

V. Solve **any three** : **(3×4=12)**

1) Draw and explain block diagram of IC 74C926.
2) Design a timer using XR2240 to generate a delay of 300 seconds in two sections.

3) Compare between Thermocouple and RTD.

4) Design a signal conditioning circuit to convert 0°C to 150°C in to 4mA to 20mA. Use PT 100.

VI. Solve **any one** : **(1×8=8)**

1) Draw and explain ladder diagram for bottle filling plant.

2) Design a frequency measurement setup to measure frequency up to 100 KHz with 0.1 Hz accuracy.

VII. Design a $3\frac{1}{2}$ digit DVM to measure V_{in} = 2V. Use 1 MHz clock. **8**

SLR-VB – 180

Seat No.	

Set **S**

T.E. (E & TC) (Part – II) (New CGPA) Examination, 2017
ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date : Friday, 19-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

***Note** : 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 suitable data if **necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) In ON – OFF controller, error voltage (V_e) is given by
   a) $V_e = V_{SP} + V_{PV}$ b) $V_e = V_{PV} - V_{SP}$
   c) $V_e = V_{SP} - V_{PV}$ d) $V_e = V_{PV} + V_{SP}$

2) The number of displays required to measure ratio of two frequencies up to 1000 using IC 74C926 are
   a) 3 b) 4 c) 5 d) 6

3) A high level signal on display select input of IC 74C926, displays output of
   a) Latches b) Counters
   c) Both a) and b) d) None of these

4) For input voltage range 0 – 4V, $t_2 = 4000$, required DVM display is
   a) 2 digit b) 3 digit c) $3\frac{1}{2}$ digit d) $3\frac{3}{4}$ digit

5) The last instruction on the rung must be an
   a) Input instruction b) Output instruction
   c) Either a) or b) d) All of these

6) As the breakdown voltage reached, the DIAC exhibits
   a) Negative resistance characteristics
   b) Goes into avalanche condition
   c) Voltage drop snaps back
   d) All of these

P.T.O.

7) An SCR can be used
   a) as static conductor
   b) for power control
   c) for speed control of dc shunt motor
   d) all of these

8) In reverse blocking mode of a thyristor
   a) junction J2 is in reverse bias and J1, J3 is in forward bias
   b) junction J3 is in forward bias and J1, J2 is in reverse bias
   c) junction J1, J3 is in reverse bias and J2 is in forward bias
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9) In a $P_1N_1P_2N_2$ thyristor which layer is less doped ?
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10) Delay time is defined by the interval when
   a) gate current increases from 90% to 100% of its final value
   b) anode current reaches 10% from forward leakage current
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11) In a PLL frequency synthesizer, a value of divide-by-N network varies from 1 to 100 in a single steps increment with f_{in} = 0.1 KHz. What is the value of synthesizer output ?
   a) 100 Hz to 10000 Hz in 0.1 KHz increments
   b) 1 KHz to 100 KHz in 1 KHz increments
   c) 1 Hz to 100 Hz in 1 Hz increments
   d) 1 KHz to 999 KHz in 100 Hz increments

12) The process of turning off of a conducting SCR is known as
   a) SCR turn off time b) Circuit turn off time
   c) Commutation d) Conduction

13) Which of the following temperature sensor has sensitivity 10 mv/°C ?
   a) LM 35 b) J – type thermocouple
   c) PT 100 d) None of above

14) In XR2240 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

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SLR-VB – 180

Seat No.	

T.E. (E & TC) (Part – II) (New CGPA) Examination, 2017
ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date : Friday, 19-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

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

1) Explain two transistor analogy of SCR.
2) How does Class B type self commutation by an LC circuit turns off SCR ?
3) How AC power control for a fan regulator is achieved using DIAC and TRIAC ?
4) Write a note on Induction and dielectric heating.

III. Answer **any one** : **(8×1=8)**

1) With the help of circuit diagram and waveform explain single phase half wave controlled rectifier with inductive load. Derive the expressions for Average DC output voltage. What is the effect of free wheeling diode when connected across inductive load ?
2) With the help of block diagram explain the PLL IC LM 565. Using PLL IC 565, design and explain working of FSK demodulator.

IV. Design a frequency synthesizer to generate a frequency of 1 KHz to 999 KHz using IC CD 4046. Use 4.43 MHz crystal. **8**

SECTION – II

V. Solve **any three** : **(3×4=12)**

1) Draw and explain block diagram of IC 74C926.
2) Design a timer using XR2240 to generate a delay of 300 seconds in two sections.

3) Compare between Thermocouple and RTD.

4) Design a signal conditioning circuit to convert 0°C to 150°C in to 4mA to 20mA. Use PT 100.

VI. Solve **any one** : **(1×8=8)**

1) Draw and explain ladder diagram for bottle filling plant.

2) Design a frequency measurement setup to measure frequency up to 100 KHz with 0.1 Hz accuracy.

VII. Design a $3\frac{1}{2}$ digit DVM to measure V_{in} = 2V. Use 1 MHz clock. **8**

SLR-VB – 181

Seat No.	

Set **P**

T.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
OPTICAL COMMUNICATION (New)

Day and Date : Monday, 22-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answers :

1) In an optical fiber, the inner core is _____ the cladding.
   a) Denser than b) Less dense than
   c) Both have same density d) None of the above

2) When the angle of incidence is _____ the critical angle, the light beam bends along the interface ?
   a) More than b) Less than
   c) Equal to d) None of a), b), c)

3) Edge emitter LED has _____ modulation bandwidth than surface emitters with same drive level.
   a) Less b) Better
   c) One half d) Same

4) _____ absorption requires assistance of photons so that momentum as well as energy is conserved.
   a) Direct b) Indirect
   c) Direct but not indirect d) Both a) and b)

5) The phototransistor provides internal gain of the photocurrent through _____
   a) Avalanche multiplication b) Transistor action
   c) Both a) and b) d) None of these

P.T.O.

6) LASER works on _____ principle.
   a) Absorption
   b) Stimulated emission
   c) Spontaneous emission
   d) Both b) and c)

7) If photodiode is having responsivity 0.8 A/W and optical power of 25 μ W, then photocurrent generated is _____
   a) 20 μ A
   b) 25 μ A
   c) 18 μ A
   d) None of the above

8) The cut back technique is regarded as Reference Test Method (RTM) for _____ measurement.
   a) Diameter
   b) Dispersion
   c) Field
   d) Attenuation

9) Stimulated emission occur in semiconductor when following condition is satisfied _____
   a) $E_{fc} - E_{fv} = 0$
   b) $E_{fc} - E_{fv} > E_g$
   c) $E_{fc} - E_{fv} > hf > E_g$
   d) $hf > E_g$

10) Rayleigh and Mie scattering are the types of _____
   a) Linear scattering
   b) Nonlinear scattering
   c) Exponential scattering
   d) None of these

11) Loss in dB due to Fresnel reflection at a single interface is _____
   a) $-10\log_{10}(1 - r)$
   b) $-10\log_{10}(r - 1)$
   c) $10\log_{10}(1 - r)$
   d) $10\log_{10}(r - 1)$

12) _____ are the semipermanent or permanent joints.
   a) Connectors
   b) Splices
   c) Couplers
   d) None of the above

13) In a 5 km long fiber, the output power is half of the input power, then what is the loss coefficient ?
   a) 0.06 dB/km
   b) 0.3 dB/km
   c) 0.6 dB/km
   d) 3 dB/km

14) Silicon is not suitable for fabrication of light emitting diodes _____
   a) An indirect band gap semiconductor
   b) An direct band gap semiconductor
   c) An wide band gap semiconductor
   d) None of the above

_____

SLR-VB – 181

Seat No.	

T.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
OPTICAL COMMUNICATION (New)

Day and Date : Monday, 22-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Answer **any four** : **16**

i) Explain working principle of LASER.

ii) A multimode step index fiber with a core diameter of 80 μ m and a relative index difference of 1.5% is operating at a wavelength of 0.85 μ m. If the core refractive index is 1.48, estimate :
   a) the normalized frequency of the fiber.
   b) the number of guided modes.

iii) Explain vapour phase deposition technique for preparing fiber optics.

iv) Explain material absorption losses in silica glass fiber.

v) What are splices ? Explain mechanical splicing technique.

3. Answer **any two** : **12**

a) A 6 Km optical link consists of multimode step index fiber with core refractive index of 1.5 and a relative refractive index difference of 1%. Estimate :
   i) The delay difference between the slowest and fastest modes at the fiber output.
   ii) The rms pulse broadening due to intermodal dispersion on the link.
   iii) The maximum bit rate obtained without substantial errors on the link assuming intermodal dispersion.
   iv) Bandwidth length product.

b) Explain in brief types of optical fibers.

c) Explain intermodal dispersion in multimode step index fiber.

SECTION – II

4. Answer **any four** : **16**

i) Explain the working of surface emitter LED.

ii) Explain the principle of p-i-n photodiode.

iii) Explain the transmitter design for optical communication.

iv) Explain briefly the cut off wavelength measurements.

v) When 10^{11} photons per second each with an energy of 1.28×10^{-19} J are incident on an ideal photodiode, calculate :

a) The wavelength of incident radiation.

b) The output photocurrent.

5. Answer **any two** : **12**

a) The quantum efficiency of a particular silicon RAPD is 80% for the detection of radiation at a wavelength of 0.9 μ m. When the incident optical is 0.5 μ W, the output current from the device (after avalanche gain) is 11 μ A. Determine the multiplication factor.

b) Define the term LED power, quantum efficiency and derive expression for them.

c) Explain the concept of WDM system.

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SLR-VB – 181

Seat No.	

Set **Q**

T.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
OPTICAL COMMUNICATION (New)

Day and Date : Monday, 22-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answers :

1) The cut back technique is regarded as Reference Test Method (RTM) for _____ measurement.
   a) Diameter b) Dispersion
   c) Field d) Attenuation

2) Stimulated emission occur in semiconductor when following condition is satisfied _____
   a) $E_{fc} - E_{fv} = 0$ b) $E_{fc} - E_{fv} > E_g$
   c) $E_{fc} - E_{fv} > hf > E_g$ d) $hf > E_g$

3) Rayleigh and Mie scattering are the types of _____
   a) Linear scattering b) Nonlinear scattering
   c) Exponential scattering d) None of these

4) Loss in dB due to Fresnel reflection at a single interface is _____
   a) $-10\log_{10}(1 - r)$ b) $-10\log_{10}(r - 1)$
   c) $10\log_{10}(1 - r)$ d) $10\log_{10}(r - 1)$

5) _____ are the semipermanent or permanent joints.
   a) Connectors b) Splices
   c) Couplers d) None of the above

6) In a 5 km long fiber, the output power is half of the input power, then what is the loss coefficient ?
   a) 0.06 dB/km
   b) 0.3 dB/km
   c) 0.6 dB/km
   d) 3 dB/km

7) Silicon is not suitable for fabrication of light emitting diodes _____
   a) An indirect band gap semiconductor
   b) An direct band gap semiconductor
   c) An wide band gap semiconductor
   d) None of the above

8) In an optical fiber, the inner core is _____ the cladding.
   a) Denser than
   b) Less dense than
   c) Both have same density
   d) None of the above

9) When the angle of incidence is _____ the critical angle, the light beam bends along the interface ?
   a) More than
   b) Less than
   c) Equal to
   d) None of a), b), c)

10) Edge emitter LED has _____ modulation bandwidth than surface emitters with same drive level.
   a) Less
   b) Better
   c) One half
   d) Same

11) _____ absorption requires assistance of photons so that momentum as well as energy is conserved.
   a) Direct
   b) Indirect
   c) Direct but not indirect
   d) Both a) and b)

12) The phototransistor provides internal gain of the photocurrent through _____
   a) Avalanche multiplication
   b) Transistor action
   c) Both a) and b)
   d) None of these

13) LASER works on _____ principle.
   a) Absorption
   b) Stimulated emission
   c) Spontaneous emission
   d) Both b) and c)

14) If photodiode is having responsivity 0.8 A/W and optical power of 25 μ W, then photocurrent generated is _____
   a) 20 μ A
   b) 25 μ A
   c) 18 μ A
   d) None of the above

_____

SLR-VB – 181

Seat No.	

T.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
OPTICAL COMMUNICATION (New)

Day and Date : Monday, 22-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Answer **any four** : **16**

i) Explain working principle of LASER.

ii) A multimode step index fiber with a core diameter of 80 μ m and a relative index difference of 1.5% is operating at a wavelength of 0.85 μ m. If the core refractive index is 1.48, estimate :
   a) the normalized frequency of the fiber.
   b) the number of guided modes.

iii) Explain vapour phase deposition technique for preparing fiber optics.

iv) Explain material absorption losses in silica glass fiber.

v) What are splices ? Explain mechanical splicing technique.

3. Answer **any two** : **12**

a) A 6 Km optical link consists of multimode step index fiber with core refractive index of 1.5 and a relative refractive index difference of 1%. Estimate :
   i) The delay difference between the slowest and fastest modes at the fiber output.
   ii) The rms pulse broadening due to intermodal dispersion on the link.
   iii) The maximum bit rate obtained without substantial errors on the link assuming intermodal dispersion.
   iv) Bandwidth length product.

b) Explain in brief types of optical fibers.

c) Explain intermodal dispersion in multimode step index fiber.

SECTION – II

4. Answer **any four** : **16**

i) Explain the working of surface emitter LED.

ii) Explain the principle of p-i-n photodiode.

iii) Explain the transmitter design for optical communication.

iv) Explain briefly the cut off wavelength measurements.

v) When 10^{11} photons per second each with an energy of 1.28×10^{-19} J are incident on an ideal photodiode, calculate :

a) The wavelength of incident radiation.

b) The output photocurrent.

5. Answer **any two** : **12**

a) The quantum efficiency of a particular silicon RAPD is 80% for the detection of radiation at a wavelength of 0.9 μ m. When the incident optical is 0.5 μ W, the output current from the device (after avalanche gain) is 11 μ A. Determine the multiplication factor.

b) Define the term LED power, quantum efficiency and derive expression for them.

c) Explain the concept of WDM system.

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SLR-VB – 181

Seat No.	

Set **R**

T.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
OPTICAL COMMUNICATION (New)

Day and Date : Monday, 22-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answers :

1) The phototransistor provides internal gain of the photocurrent through _____
   a) Avalanche multiplication b) Transistor action
   c) Both a) and b) d) None of these

2) LASER works on _____ principle.
   a) Absorption b) Stimulated emission
   c) Spontaneous emission d) Both b) and c)

3) If photodiode is having responsivity 0.8 A/W and optical power of 25 μ W, then photocurrent generated is _____
   a) 20 μ A b) 25 μ A
   c) 18 μ A d) None of the above

4) The cut back technique is regarded as Reference Test Method (RTM) for _____ measurement.
   a) Diameter b) Dispersion
   c) Field d) Attenuation

5) Stimulated emission occur in semiconductor when following condition is satisfied _____
   a) $E_{fc} - E_{fv} = 0$ b) $E_{fc} - E_{fv} > E_g$
   c) $E_{fc} - E_{fv} > hf > E_g$ d) $hf > E_g$

P.T.O.

6) Rayleigh and Mie scattering are the types of _____
   a) Linear scattering
   b) Nonlinear scattering
   c) Exponential scattering
   d) None of these

7) Loss in dB due to Fresnel reflection at a single interface is _____
   a) $-10\log_{10}(1 - r)$
   b) $-10\log_{10}(r - 1)$
   c) $10\log_{10}(1 - r)$
   d) $10\log_{10}(r - 1)$

8) _____ are the semipermanent or permanent joints.
   a) Connectors
   b) Splices
   c) Couplers
   d) None of the above

9) In a 5 km long fiber, the output power is half of the input power, then what is the loss coefficient ?
   a) 0.06 dB/km
   b) 0.3 dB/km
   c) 0.6 dB/km
   d) 3 dB/km

10) Silicon is not suitable for fabrication of light emitting diodes _____
   a) An indirect band gap semiconductor
   b) An direct band gap semiconductor
   c) An wide band gap semiconductor
   d) None of the above

11) In an optical fiber, the inner core is _____ the cladding.
   a) Denser than
   b) Less dense than
   c) Both have same density
   d) None of the above

12) When the angle of incidence is _____ the critical angle, the light beam bends along the interface ?
   a) More than
   b) Less than
   c) Equal to
   d) None of a), b), c)

13) Edge emitter LED has _____ modulation bandwidth than surface emitters with same drive level.
   a) Less
   b) Better
   c) One half
   d) Same

14) _____ absorption requires assistance of photons so that momentum as well as energy is conserved.
   a) Direct
   b) Indirect
   c) Direct but not indirect
   d) Both a) and b)

_____

SLR-VB – 181

Seat No.	

T.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
OPTICAL COMMUNICATION (New)

Day and Date : Monday, 22-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Answer **any four** : **16**

i) Explain working principle of LASER.

ii) A multimode step index fiber with a core diameter of 80 μ m and a relative index difference of 1.5% is operating at a wavelength of 0.85 μ m. If the core refractive index is 1.48, estimate :
   a) the normalized frequency of the fiber.
   b) the number of guided modes.

iii) Explain vapour phase deposition technique for preparing fiber optics.

iv) Explain material absorption losses in silica glass fiber.

v) What are splices ? Explain mechanical splicing technique.

3. Answer **any two** : **12**

a) A 6 Km optical link consists of multimode step index fiber with core refractive index of 1.5 and a relative refractive index difference of 1%. Estimate :
   i) The delay difference between the slowest and fastest modes at the fiber output.
   ii) The rms pulse broadening due to intermodal dispersion on the link.
   iii) The maximum bit rate obtained without substantial errors on the link assuming intermodal dispersion.
   iv) Bandwidth length product.

b) Explain in brief types of optical fibers.

c) Explain intermodal dispersion in multimode step index fiber.

SECTION – II

4. Answer **any four** : **16**

i) Explain the working of surface emitter LED.

ii) Explain the principle of p-i-n photodiode.

iii) Explain the transmitter design for optical communication.

iv) Explain briefly the cut off wavelength measurements.

v) When 10^{11} photons per second each with an energy of 1.28×10^{-19} J are incident on an ideal photodiode, calculate :

a) The wavelength of incident radiation.

b) The output photocurrent.

5. Answer **any two** : **12**

a) The quantum efficiency of a particular silicon RAPD is 80% for the detection of radiation at a wavelength of 0.9 μ m. When the incident optical is 0.5 μ W, the output current from the device (after avalanche gain) is 11 μ A. Determine the multiplication factor.

b) Define the term LED power, quantum efficiency and derive expression for them.

c) Explain the concept of WDM system.

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SLR-VB – 181

Seat No.	

Set **S**

T.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
OPTICAL COMMUNICATION (New)

Day and Date : Monday, 22-5-2017 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.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answers :

1) Rayleigh and Mie scattering are the types of _____
   a) Linear scattering b) Nonlinear scattering
   c) Exponential scattering d) None of these

2) Loss in dB due to Fresnel reflection at a single interface is _____
   a) $-10\log_{10}(1-r)$ b) $-10\log_{10}(r-1)$
   c) $10\log_{10}(1-r)$ d) $10\log_{10}(r-1)$

3) _____ are the semipermanent or permanent joints.
   a) Connectors b) Splices
   c) Couplers d) None of the above

4) In a 5 km long fiber, the output power is half of the input power, then what is the loss coefficient ?
   a) 0.06 dB/km b) 0.3 dB/km
   c) 0.6 dB/km d) 3 dB/km

5) Silicon is not suitable for fabrication of light emitting diodes _____
   a) An indirect band gap semiconductor
   b) An direct band gap semiconductor
   c) An wide band gap semiconductor
   d) None of the above

6) In an optical fiber, the inner core is _____ the cladding.
   a) Denser than b) Less dense than
   c) Both have same density d) None of the above

7) When the angle of incidence is _____ the critical angle, the light beam bends along the interface ?
   a) More than b) Less than
   c) Equal to d) None of a), b), c)

8) Edge emitter LED has _____ modulation bandwidth than surface emitters with same drive level.
   a) Less b) Better
   c) One half d) Same

9) _____ absorption requires assistance of photons so that momentum as well as energy is conserved.
   a) Direct b) Indirect
   c) Direct but not indirect d) Both a) and b)

10) The phototransistor provides internal gain of the photocurrent through _____
   a) Avalanche multiplication b) Transistor action
   c) Both a) and b) d) None of these

11) LASER works on _____ principle.
   a) Absorption b) Stimulated emission
   c) Spontaneous emission d) Both b) and c)

12) If photodiode is having responsivity 0.8 A/W and optical power of 25 μ W, then photocurrent generated is _____
   a) 20 μ A b) 25 μ A
   c) 18 μ A d) None of the above

13) The cut back technique is regarded as Reference Test Method (RTM) for _____ measurement.
   a) Diameter b) Dispersion
   c) Field d) Attenuation

14) Stimulated emission occur in semiconductor when following condition is satisfied _____
   a) $E_{fc} - E_{fv} = 0$ b) $E_{fc} - E_{fv} > E_g$
   c) $E_{fc} - E_{fv} > hf > E_g$ d) $hf > E_g$

_____

SLR-VB – 181

Seat No.	

T.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2017
OPTICAL COMMUNICATION (New)

Day and Date : Monday, 22-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Answer **any four** : **16**

i) Explain working principle of LASER.

ii) A multimode step index fiber with a core diameter of 80 μ m and a relative index difference of 1.5% is operating at a wavelength of 0.85 μ m. If the core refractive index is 1.48, estimate :
   a) the normalized frequency of the fiber.
   b) the number of guided modes.

iii) Explain vapour phase deposition technique for preparing fiber optics.

iv) Explain material absorption losses in silica glass fiber.

v) What are splices ? Explain mechanical splicing technique.

3. Answer **any two** : **12**

a) A 6 Km optical link consists of multimode step index fiber with core refractive index of 1.5 and a relative refractive index difference of 1%. Estimate :
   i) The delay difference between the slowest and fastest modes at the fiber output.
   ii) The rms pulse broadening due to intermodal dispersion on the link.
   iii) The maximum bit rate obtained without substantial errors on the link assuming intermodal dispersion.
   iv) Bandwidth length product.

b) Explain in brief types of optical fibers.

c) Explain intermodal dispersion in multimode step index fiber.

SECTION – II

4. Answer **any four** : **16**

i) Explain the working of surface emitter LED.

ii) Explain the principle of p-i-n photodiode.

iii) Explain the transmitter design for optical communication.

iv) Explain briefly the cut off wavelength measurements.

v) When 10^{11} photons per second each with an energy of 1.28×10^{-19} J are incident on an ideal photodiode, calculate :

a) The wavelength of incident radiation.

b) The output photocurrent.

5. Answer **any two** : **12**

a) The quantum efficiency of a particular silicon RAPD is 80% for the detection of radiation at a wavelength of 0.9 μ m. When the incident optical is 0.5 μ W, the output current from the device (after avalanche gain) is 11 μ A. Determine the multiplication factor.

b) Define the term LED power, quantum efficiency and derive expression for them.

c) Explain the concept of WDM system.

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SLR-VB – 182

Seat No.	

Set P

T.E. (Electronics and Telecommunication) (Part – II) (New) (CGPA) Examination, 2017

MOBILE COMMUNICATION

Day and Date : Wednesday, 24-5-2017 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) 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 answer : **(14×1=14)**

1) Co-channel reuse ratio for cluster size 3 is

a) 3 b) 4 c) 3.5 d) 2

2) Decreasing the cluster size, the system capacity is _____

a) Decreases b) Increases

c) Constant d) None of these

3) The frequency reuse factor of a cellular system is given by

a) N^2 b) 1/N c) N d) None of these

4) What is Fraunhofer distance for f = 900 M Hz and largest linear antenna dimension is 0.5 ?

a) 1.5 m b) 2 m

c) 3 m d) None of these

P.T.O.

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) TDMA allows the user to have
   a) Use of same frequency for same time slot
   b) Use of same frequency channel for different time slot
   c) Use of same time slot for different frequency channel
   d) Use of different time slot for different frequency channel

7) FDMA, TDMA and CDMA are
   a) Automatic repeat technique b) Channelization technique
   c) Bit oriented technique d) None of these

8) The uplink frequency of P-GSM system is
   a) 1850-1910 MHz b) 1710-1785 MHz
   c) 890-915 MHz d) None of these

9) Standard GSM systems support a data rate of
   a) 9.6 kbps b) 64 kbps
   c) 128 kbps d) 120 kbps

10) GSM stands for
   a) Global service for mobile b) Global system for mobile
   c) Group of special machines d) Global scope for mobile

11) In IS-95 CDMA, forward channel uses _____ modulation technique while reverse channel uses OQPSK modulation.
   a) PSK b) QPSK c) 8-PSK d) None of these

12) Access channel uses a frame of _____ bit at 4.8 kbps speed and require 20 ms to send a frame.
   a) 96 b) 115 c) 72 d) None of these

13) IMT 2000 stands for
   a) International Mobile Telecommunication
   b) Interim Mobile Telecommunication
   c) International Mobile Technology
   d) None of these

14) In IMT 2000 _____ channel is used to send alert message to the subscriber to page the information.
   a) Primary common control physical channel
   b) Acquisition indication channel
   c) Paging indication channel
   d) None of these

_____

SLR-VB – 182

Seat No.	

T.E. (Electronics and Telecommunication) (Part – II) (New) (CGPA)

Examination, 2017

MOBILE COMMUNICATION

Day and Date : Wednesday, 24-5-2017 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. Solve **any four** : **(4×4=16)**

a) What is diffraction ? Explain knife edge diffraction.

b) Explain channel assignment strategies in cellular system.

c) What is SSMA ? Explain DSMA technique.

d) Explain parameters of multipath channels.

e) Explain frequency reuse technique in cellular system.

3. Solve **any two** : **(6×2=12)**

a) What is SDMA technique ? Compare different multiple access techniques.

b) Explain in brief different methods used to improve capacity of cellular system.

c) Explain two ray model in detail.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Explain speech coding in GSM.

   b) What is Handoff ? Explain Handoff in GSM.

   c) Explain forward link and reverse link structure in IS-95 CDMA system.

   d) Explain packet and frame format for forward CDMA IS-95 channels.

   e) Explain with neat block diagram forward channels in W-CDMA.

5. Solve **any two** : **(6×2=12)**

   a) Draw and explain GSM signaling protocol architecture in detail.

   b) Explain in detail forward and reverse IS 95-CDMA channels.

   c) Give the detail comparison for IS-95, IMT-2000 and WCDMA STD's.

SLR-VB – 182

Seat No.	

Set Q

T.E. (Electronics and Telecommunication) (Part – II) (New) (CGPA) Examination, 2017
MOBILE COMMUNICATION

Day and Date : Wednesday, 24-5-2017 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) 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 answer : **(14×1=14)**

1) The uplink frequency of P-GSM system is
   a) 1850-1910 MHz b) 1710-1785 MHz
   c) 890-915 MHz d) None of these

2) Standard GSM systems support a data rate of
   a) 9.6 kbps b) 64 kbps
   c) 128 kbps d) 120 kbps

3) GSM stands for
   a) Global service for mobile b) Global system for mobile
   c) Group of special machines d) Global scope for mobile

4) In IS-95 CDMA, forward channel uses _____ modulation technique while reverse channel uses OQPSK modulation.
   a) PSK b) QPSK c) 8-PSK d) None of these

5) Access channel uses a frame of _____ bit at 4.8 kbps speed and require 20 ms to send a frame.
   a) 96 b) 115 c) 72 d) None of these

6) IMT 2000 stands for
   a) International Mobile Telecommunication
   b) Interim Mobile Telecommunication
   c) International Mobile Technology
   d) None of these

7) In IMT 2000 _____ channel is used to send alert message to the subscriber to page the information.
   a) Primary common control physical channel
   b) Acquisition indication channel
   c) Paging indication channel
   d) None of these

8) Co-channel reuse ratio for cluster size 3 is
   a) 3 b) 4 c) 3.5 d) 2

9) Decreasing the cluster size, the system capacity is _____
   a) Decreases b) Increases
   c) Constant d) None of these

10) The frequency reuse factor of a cellular system is given by
   a) N^2 b) 1/N c) N d) None of these

11) What is Fraunhofer distance for f = 900 M Hz and largest linear antenna dimension is 0.5 ?
   a) 1.5 m b) 2 m
   c) 3 m d) None of these

12) 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

13) TDMA allows the user to have
   a) Use of same frequency for same time slot
   b) Use of same frequency channel for different time slot
   c) Use of same time slot for different frequency channel
   d) Use of different time slot for different frequency channel

14) FDMA, TDMA and CDMA are
   a) Automatic repeat technique b) Channelization technique
   c) Bit oriented technique d) None of these

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SLR-VB – 182

Seat No.	

T.E. (Electronics and Telecommunication) (Part – II) (New) (CGPA)

Examination, 2017

MOBILE COMMUNICATION

Day and Date : Wednesday, 24-5-2017 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. Solve **any four** : **(4×4=16)**

a) What is diffraction ? Explain knife edge diffraction.

b) Explain channel assignment strategies in cellular system.

c) What is SSMA ? Explain DSMA technique.

d) Explain parameters of multipath channels.

e) Explain frequency reuse technique in cellular system.

3. Solve **any two** : **(6×2=12)**

a) What is SDMA technique ? Compare different multiple access techniques.

b) Explain in brief different methods used to improve capacity of cellular system.

c) Explain two ray model in detail.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Explain speech coding in GSM.

   b) What is Handoff ? Explain Handoff in GSM.

   c) Explain forward link and reverse link structure in IS-95 CDMA system.

   d) Explain packet and frame format for forward CDMA IS-95 channels.

   e) Explain with neat block diagram forward channels in W-CDMA.

5. Solve **any two** : **(6×2=12)**

   a) Draw and explain GSM signaling protocol architecture in detail.

   b) Explain in detail forward and reverse IS 95-CDMA channels.

   c) Give the detail comparison for IS-95, IMT-2000 and WCDMA STD's.

SLR-VB – 182

Seat No.	

Set **R**

T.E. (Electronics and Telecommunication) (Part – II) (New) (CGPA) Examination, 2017
MOBILE COMMUNICATION

Day and Date : Wednesday, 24-5-2017 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) 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 answer : **(14×1=14)**

1) 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

2) TDMA allows the user to have
   a) Use of same frequency for same time slot
   b) Use of same frequency channel for different time slot
   c) Use of same time slot for different frequency channel
   d) Use of different time slot for different frequency channel

3) FDMA, TDMA and CDMA are
   a) Automatic repeat technique b) Channelization technique
   c) Bit oriented technique d) None of these

4) The uplink frequency of P-GSM system is
   a) 1850-1910 MHz b) 1710-1785 MHz
   c) 890-915 MHz d) None of these

P.T.O.

5) Standard GSM systems support a data rate of
   a) 9.6 kbps b) 64 kbps
   c) 128 kbps d) 120 kbps

6) GSM stands for
   a) Global service for mobile b) Global system for mobile
   c) Group of special machines d) Global scope for mobile

7) In IS-95 CDMA, forward channel uses _____ modulation technique while reverse channel uses OQPSK modulation.
   a) PSK b) QPSK c) 8-PSK d) None of these

8) Access channel uses a frame of _____ bit at 4.8 kbps speed and require 20 ms to send a frame.
   a) 96 b) 115 c) 72 d) None of these

9) IMT 2000 stands for
   a) International Mobile Telecommunication
   b) Interim Mobile Telecommunication
   c) International Mobile Technology
   d) None of these

10) In IMT 2000 _____ channel is used to send alert message to the subscriber to page the information.
   a) Primary common control physical channel
   b) Acquisition indication channel
   c) Paging indication channel
   d) None of these

11) Co-channel reuse ratio for cluster size 3 is
   a) 3 b) 4 c) 3.5 d) 2

12) Decreasing the cluster size, the system capacity is _____
   a) Decreases b) Increases
   c) Constant d) None of these

13) The frequency reuse factor of a cellular system is given by
   a) N^2 b) 1/N c) N d) None of these

14) What is Fraunhofer distance for f = 900 M Hz and largest linear antenna dimension is 0.5 ?
   a) 1.5 m b) 2 m
   c) 3 m d) None of these

_____

SLR-VB – 182

Seat No.	

T.E. (Electronics and Telecommunication) (Part – II) (New) (CGPA)

Examination, 2017

MOBILE COMMUNICATION

Day and Date : Wednesday, 24-5-2017 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. Solve **any four** : **(4×4=16)**

a) What is diffraction ? Explain knife edge diffraction.

b) Explain channel assignment strategies in cellular system.

c) What is SSMA ? Explain DSMA technique.

d) Explain parameters of multipath channels.

e) Explain frequency reuse technique in cellular system.

3. Solve **any two** : **(6×2=12)**

a) What is SDMA technique ? Compare different multiple access techniques.

b) Explain in brief different methods used to improve capacity of cellular system.

c) Explain two ray model in detail.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Explain speech coding in GSM.

   b) What is Handoff ? Explain Handoff in GSM.

   c) Explain forward link and reverse link structure in IS-95 CDMA system.

   d) Explain packet and frame format for forward CDMA IS-95 channels.

   e) Explain with neat block diagram forward channels in W-CDMA.

5. Solve **any two** : **(6×2=12)**

   a) Draw and explain GSM signaling protocol architecture in detail.

   b) Explain in detail forward and reverse IS 95-CDMA channels.

   c) Give the detail comparison for IS-95, IMT-2000 and WCDMA STD's.

SLR-VB – 182

Seat No.	

Set S

T.E. (Electronics and Telecommunication) (Part – II) (New) (CGPA) Examination, 2017
MOBILE COMMUNICATION

Day and Date : Wednesday, 24-5-2017 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) 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 answer : **(14×1=14)**

1) GSM stands for
   a) Global service for mobile
   b) Global system for mobile
   c) Group of special machines
   d) Global scope for mobile

2) In IS-95 CDMA, forward channel uses _____ modulation technique while reverse channel uses OQPSK modulation.
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3) Access channel uses a frame of _____ bit at 4.8 kbps speed and require 20 ms to send a frame.
   a) 96 b) 115 c) 72 d) None of these

4) IMT 2000 stands for
   a) International Mobile Telecommunication
   b) Interim Mobile Telecommunication
   c) International Mobile Technology
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P.T.O.

5) In IMT 2000 _____ channel is used to send alert message to the subscriber to page the information.
   a) Primary common control physical channel
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6) Co-channel reuse ratio for cluster size 3 is
   a) 3 b) 4 c) 3.5 d) 2

7) Decreasing the cluster size, the system capacity is _____
   a) Decreases b) Increases
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8) The frequency reuse factor of a cellular system is given by
   a) N^2 b) 1/N c) N d) None of these

9) What is Fraunhofer distance for f = 900 M Hz and largest linear antenna dimension is 0.5 ?
   a) 1.5 m b) 2 m
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10) The angle at which no reflection occurs in the medium of origin.
   a) Brewster angle b) Doppler angle
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   a) Use of same frequency for same time slot
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   c) Use of same time slot for different frequency channel
   d) Use of different time slot for different frequency channel

12) FDMA, TDMA and CDMA are
   a) Automatic repeat technique b) Channelization technique
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13) The uplink frequency of P-GSM system is
   a) 1850-1910 MHz b) 1710-1785 MHz
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14) Standard GSM systems support a data rate of
   a) 9.6 kbps b) 64 kbps
   c) 128 kbps d) 120 kbps

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SLR-VB – 182

Seat No.	

T.E. (Electronics and Telecommunication) (Part – II) (New) (CGPA)

Examination, 2017

MOBILE COMMUNICATION

Day and Date : Wednesday, 24-5-2017 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. Solve **any four** : **(4×4=16)**

a) What is diffraction ? Explain knife edge diffraction.

b) Explain channel assignment strategies in cellular system.

c) What is SSMA ? Explain DSMA technique.

d) Explain parameters of multipath channels.

e) Explain frequency reuse technique in cellular system.

3. Solve **any two** : **(6×2=12)**

a) What is SDMA technique ? Compare different multiple access techniques.

b) Explain in brief different methods used to improve capacity of cellular system.

c) Explain two ray model in detail.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Explain speech coding in GSM.

   b) What is Handoff ? Explain Handoff in GSM.

   c) Explain forward link and reverse link structure in IS-95 CDMA system.

   d) Explain packet and frame format for forward CDMA IS-95 channels.

   e) Explain with neat block diagram forward channels in W-CDMA.

5. Solve **any two** : **(6×2=12)**

   a) Draw and explain GSM signaling protocol architecture in detail.

   b) Explain in detail forward and reverse IS 95-CDMA channels.

   c) Give the detail comparison for IS-95, IMT-2000 and WCDMA STD's.

SLR-VB – 183 (C)

Seat No.	

Set P

T.E. (E & TC) (Part – II) Examination, 2017
(New – CGPA)
ROBOTICS (Self Learning)

Day and Date : Friday, 26-5-2017 Total Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

Note : *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 alternative : **(10×1=10)**

1) What is the name for information sent from robot sensors to robot controllers ?
   a) temperature b) feedback c) signal d) output

2) Which of the following terms refers to the rotational motion of a robot arm ?
   a) swivel b) axle c) roll d) yaw

3) Which of the following term is NOT one of the four basic parts of a robot ?
   a) peripheral tools b) sensor
   c) controller d) drive

4) 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

5) Which of the following is the most common type of actuator ?
   a) Electric motor b) Stepper motor
   c) Solenoid d) Hydraulic pump

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

P.T.O.

7) Robots used in automobile plants would be classified as
   a) perception system robots
   b) industrial robots
   c) mobile robots
   d) knowledge robots

8) Which of the following is the person who wrote the three laws of robotics ?
   a) Karel Capek
   b) Isaac Asimov
   c) Joseph-Marie Jacquard
   d) Richard Hohn

9) 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 humans in adventures

10) A mobile robot
   a) acts as a transportation system, like a “mailmobile”
   b) imitates some human senses
   c) performs manufacturing tasks like painting cars
   d) is another name for virtual reality

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SLR-VB – 183 (C)

Seat No.	

T.E. (E & TC) (Part – II) Examination, 2017
(New – CGPA)
ROBOTICS (Self Learning)

Day and Date : Friday, 26-5-2017 Marks : 40

Time : 3.00 p.m. to 5.00 p.m.

***Note** : Solve **any four** out of Q. **2** to Q. **7**.*

2. Write the five major components of a robot and explain the purpose of each. **10**

3. Write short note on the following : **10**

   i) Point to Point robots

   ii) Continuous path robots.

4. List the internal and external sensors. Write note on any two internal sensor with examples. **10**

5. Explain microprocessor based robot controller. **10**

6. Draw and explain components of machine vision system. **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-VB – 183 (C)

Seat No.	

Set Q

T.E. (E & TC) (Part – II) Examination, 2017
(New – CGPA)
ROBOTICS (Self Learning)

Day and Date : Friday, 26-5-2017 Total Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

Note : *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 alternative : **(10×1=10)**

1) 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 humans in adventures

2) A mobile robot
   a) acts as a transportation system, like a "mailmobile"
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   c) performs manufacturing tasks like painting cars
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   a) Karel Capek b) Isaac Asimov
   c) Joseph-Marie Jacquard d) Richard Hohn

5) What is the name for information sent from robot sensors to robot controllers ?
   a) temperature b) feedback c) signal d) output

P.T.O.

6) Which of the following terms refers to the rotational motion of a robot arm ?
   a) swivel b) axle c) roll d) yaw

7) Which of the following term is NOT one of the four basic parts of a robot ?
   a) peripheral tools b) sensor
   c) controller d) drive

8) 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

9) Which of the following is the most common type of actuator ?
   a) Electric motor b) Stepper motor
   c) Solenoid d) Hydraulic pump

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-VB – 183 (C)

Seat No.	

T.E. (E & TC) (Part – II) Examination, 2017
(New – CGPA)
ROBOTICS (Self Learning)

Day and Date : Friday, 26-5-2017 Marks : 40

Time : 3.00 p.m. to 5.00 p.m.

***Note** : Solve **any four** out of Q. **2** to Q. **7**.*

2. Write the five major components of a robot and explain the purpose of each. **10**

3. Write short note on the following : **10**

   i) Point to Point robots

   ii) Continuous path robots.

4. List the internal and external sensors. Write note on any two internal sensor with examples. **10**

5. Explain microprocessor based robot controller. **10**

6. Draw and explain components of machine vision system. **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

Set Q

SLR-VB – 183 (C)

Seat No.	

Set R

T.E. (E & TC) (Part – II) Examination, 2017
(New – CGPA)
ROBOTICS (Self Learning)

Day and Date : Friday, 26-5-2017 Total Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

Note : *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 alternative : **(10×1=10)**

1) Which of the following is the most common type of actuator ?
   a) Electric motor
   b) Stepper motor
   c) Solenoid
   d) Hydraulic pump

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) 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 humans in adventures

4) A mobile robot
   a) acts as a transportation system, like a "mailmobile"
   b) imitates some human senses
   c) performs manufacturing tasks like painting cars
   d) is another name for virtual reality

P.T.O.

5) Which of the following term is NOT one of the four basic parts of a robot ?
   a) peripheral tools b) sensor
   c) controller d) drive

6) Which of the following is a sensor that measures the movement of an object ?
   a) Pressure sensor b) Motion sensor
   c) Action sensor d) Touch sensor

7) What is the name for information sent from robot sensors to robot controllers ?
   a) temperature b) feedback c) signal d) output

8) Which of the following terms refers to the rotational motion of a robot arm ?
   a) swivel b) axle c) roll d) yaw

9) Robots used in automobile plants would be classified as
   a) perception system robots b) industrial robots
   c) mobile robots d) knowledge robots

10) Which of the following is the person who wrote the three laws of robotics ?
   a) Karel Capek b) Isaac Asimov
   c) Joseph-Marie Jacquard d) Richard Hohn

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SLR-VB – 183 (C)

Seat No.	

T.E. (E & TC) (Part – II) Examination, 2017
(New – CGPA)
ROBOTICS (Self Learning)

Day and Date : Friday, 26-5-2017 Marks : 40

Time : 3.00 p.m. to 5.00 p.m.

***Note** : Solve **any four** out of Q. **2** to Q. **7**.*

2. Write the five major components of a robot and explain the purpose of each. **10**

3. Write short note on the following : **10**

   i) Point to Point robots

   ii) Continuous path robots.

4. List the internal and external sensors. Write note on any two internal sensor with examples. **10**

5. Explain microprocessor based robot controller. **10**

6. Draw and explain components of machine vision system. **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

Set R

SLR-VB – 183 (C)

Seat No.	

Set S

T.E. (E & TC) (Part – II) Examination, 2017
(New – CGPA)
ROBOTICS (Self Learning)

Day and Date : Friday, 26-5-2017 Total Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

Note : *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 alternative : **(10×1=10)**

1) Which of the following term is NOT one of the four basic parts of a robot ?

a) peripheral tools b) sensor

c) controller d) drive

2) 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

3) Which of the following is the most common type of actuator ?

a) Electric motor b) Stepper motor

c) Solenoid d) Hydraulic pump

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) Robots used in automobile plants would be classified as

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c) mobile robots d) knowledge robots

P.T.O.

6) Which of the following is the person who wrote the three laws of robotics ?
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   d) Richard Hohn

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   b) machine that thinks like a human
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8) A mobile robot
   a) acts as a transportation system, like a “mailmobile”
   b) imitates some human senses
   c) performs manufacturing tasks like painting cars
   d) is another name for virtual reality

9) What is the name for information sent from robot sensors to robot controllers ?
   a) temperature b) feedback c) signal d) output

10) Which of the following terms refers to the rotational motion of a robot arm ?
   a) swivel b) axle c) roll d) yaw

SLR-VB – 183 (C)

Seat No.	

T.E. (E & TC) (Part – II) Examination, 2017
(New – CGPA)
ROBOTICS (Self Learning)

Day and Date : Friday, 26-5-2017 Marks : 40

Time : 3.00 p.m. to 5.00 p.m.

***Note** : Solve **any four** out of Q. **2** to Q. **7**.*

2. Write the five major components of a robot and explain the purpose of each. **10**

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5. Explain microprocessor based robot controller. **10**

6. Draw and explain components of machine vision system. **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

Set S

SLR-VB – 183(a)

Seat No.	

Set P

T.E. (E&TC) (Part – II) (New) (CGPA) Examination, 2017
Self Learning
COMPUTER ORGANIZATION

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 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 :

1) 1 byte = _____ bits.
   a) 32 b) 16
   c) 8 d) 4

2) Processor has 8 address line then maximum _____ byte memory can be interfaced.
   a) 256 b) 512
   c) 1024 d) 2048

3) In Computer logical operation performed by which of the following unit ?
   a) DMA b) PPI
   c) ALU d) USART

4) Which of the following are not memory allocation schemes ?
   a) FIFO b) LRU
   c) OPT d) UART

5) ISR related to which of the following unit ?
   a) Timer b) USART
   c) Interrupt d) Serial communication

P.T.O.

6) Which of the architecture having less number of instructions ?
   a) CISC
   b) RISC
   c) Both a) and b)
   d) None of these

7) Directly multiplication instruction available in
   a) CISC
   b) RISC
   c) Both a) and b)
   d) None of these

8) To store temporary data in computer _____ memory is used.
   a) RAM
   b) ROM
   c) EAROM
   d) EPROM

9) In CD-ROM for readout which technique is used ?
   a) Optical record
   b) Magnetic record
   c) Electric record
   d) None of the above

10) Which memory is positioned logically used between the CPU registers and main memory ?
   a) Cache memory
   b) Secondary memory
   c) Both a) and b)
   d) None of the above

_____

SLR-VB – 183(a)

Seat No.	

T.E. (E&TC) (Part – II) (New) (CGPA) Examination, 2017
Self Learning
COMPUTER ORGANIZATION

Day and Date : Friday, 26-5-2017 Marks : 40

Time : 3.00 p.m. to 5.00 p.m.

2. Attempt **any 4** (**each 10** marks).
   1) Explain Multi level memory in details; explain Virtual memory and Cache memory.
   2) Explain different types of memory and its use in computer.
   3) Write note on CPU.
   4) Explain instruction set of microprocessor in detail.
   5) Explain CISC ad RISC Architecture in detail.
   6) What is DMA ? Explain in detail.

Set P

SLR-VB – 183(a)

Seat No.	

Set Q

T.E. (E&TC) (Part – II) (New) (CGPA) Examination, 2017
Self Learning
COMPUTER ORGANIZATION

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 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 :

1) In CD-ROM for readout which technique is used ?
   a) Optical record b) Magnetic record
   c) Electric record d) None of the above

2) Which memory is positioned logically used between the CPU registers and main memory ?
   a) Cache memory b) Secondary memory
   c) Both a) and b) d) None of the above

3) Directly multiplication instruction available in
   a) CISC b) RISC
   c) Both a) and b) d) None of these

4) To store temporary data in computer _____ memory is used.
   a) RAM b) ROM
   c) EAROM d) EPROM

P.T.O.

5) 1 byte = _____ bits.
   a) 32 b) 16
   c) 8 d) 4

6) Processor has 8 address line then maximum _____ byte memory can be interfaced.
   a) 256 b) 512
   c) 1024 d) 2048

7) In Computer logical operation performed by which of the following unit ?
   a) DMA b) PPI
   c) ALU d) USART

8) Which of the following are not memory allocation schemes ?
   a) FIFO b) LRU
   c) OPT d) UART

9) ISR related to which of the following unit ?
   a) Timer b) USART
   c) Interrupt d) Serial communication

10) Which of the architecture having less number of instructions ?
   a) CISC b) RISC
   c) Both a) and b) d) None of these

_____

SLR-VB – 183(a)

Seat No.	

T.E. (E&TC) (Part – II) (New) (CGPA) Examination, 2017
Self Learning
COMPUTER ORGANIZATION

Day and Date : Friday, 26-5-2017 Marks : 40

Time : 3.00 p.m. to 5.00 p.m.

2. Attempt **any 4** (**each 10** marks).
   1) Explain Multi level memory in details; explain Virtual memory and Cache memory.
   2) Explain different types of memory and its use in computer.
   3) Write note on CPU.
   4) Explain instruction set of microprocessor in detail.
   5) Explain CISC ad RISC Architecture in detail.
   6) What is DMA ? Explain in detail.

Set Q

Set Q

SLR-VB – 183(a)

Seat No.	

Set R

T.E. (E&TC) (Part – II) (New) (CGPA) Examination, 2017
Self Learning
COMPUTER ORGANIZATION

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 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 :

1) ISR related to which of the following unit ?
   a) Timer b) USART
   c) Interrupt d) Serial communication

2) Which of the architecture having less number of instructions ?
   a) CISC b) RISC
   c) Both a) and b) d) None of these

3) In CD-ROM for readout which technique is used ?
   a) Optical record b) Magnetic record
   c) Electric record d) None of the above

4) Which memory is positioned logically used between the CPU registers and main memory ?
   a) Cache memory b) Secondary memory
   c) Both a) and b) d) None of the above

P.T.O.

5) In Computer logical operation performed by which of the following unit ?
   a) DMA b) PPI
   c) ALU d) USART

6) Which of the following are not memory allocation schemes ?
   a) FIFO b) LRU
   c) OPT d) UART

7) 1 byte = _____ bits.
   a) 32 b) 16
   c) 8 d) 4

8) Processor has 8 address line then maximum _____ byte memory can be interfaced.
   a) 256 b) 512
   c) 1024 d) 2048

9) Directly multiplication instruction available in
   a) CISC b) RISC
   c) Both a) and b) d) None of these

10) To store temporary data in computer _____ memory is used.
   a) RAM b) ROM
   c) EAROM d) EPROM

_____

SLR-VB – 183(a)

Seat No.	

T.E. (E&TC) (Part – II) (New) (CGPA) Examination, 2017
Self Learning
COMPUTER ORGANIZATION

Day and Date : Friday, 26-5-2017 Marks : 40

Time : 3.00 p.m. to 5.00 p.m.

2. Attempt **any 4** (**each 10** marks).
   1) Explain Multi level memory in details; explain Virtual memory and Cache memory.
   2) Explain different types of memory and its use in computer.
   3) Write note on CPU.
   4) Explain instruction set of microprocessor in detail.
   5) Explain CISC ad RISC Architecture in detail.
   6) What is DMA ? Explain in detail.

Set R

SLR-VB – 183(a)

Seat No.	

Set S

T.E. (E&TC) (Part – II) (New) (CGPA) Examination, 2017
Self Learning
COMPUTER ORGANIZATION

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 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 :

1) In Computer logical operation performed by which of the following unit ?
   a) DMA b) PPI
   c) ALU d) USART

2) Which of the following are not memory allocation schemes ?
   a) FIFO b) LRU
   c) OPT d) UART

3) ISR related to which of the following unit ?
   a) Timer b) USART
   c) Interrupt d) Serial communication

4) Which of the architecture having less number of instructions ?
   a) CISC b) RISC
   c) Both a) and b) d) None of these

5) Directly multiplication instruction available in
   a) CISC b) RISC
   c) Both a) and b) d) None of these

P.T.O.

6) To store temporary data in computer _____ memory is used.
   a) RAM b) ROM
   c) EAROM d) EPROM

7) In CD-ROM for readout which technique is used ?
   a) Optical record b) Magnetic record
   c) Electric record d) None of the above

8) Which memory is positioned logically used between the CPU registers and main memory ?
   a) Cache memory b) Secondary memory
   c) Both a) and b) d) None of the above

9) 1 byte = _____ bits.
   a) 32 b) 16
   c) 8 d) 4

10) Processor has 8 address line then maximum _____ byte memory can be interfaced.
   a) 256 b) 512
   c) 1024 d) 2048

_____

SLR-VB – 183(a)

Seat No.	

T.E. (E&TC) (Part – II) (New) (CGPA) Examination, 2017
Self Learning
COMPUTER ORGANIZATION

Day and Date : Friday, 26-5-2017 Marks : 40

Time : 3.00 p.m. to 5.00 p.m.

2. Attempt **any 4** (**each 10** marks).
   1) Explain Multi level memory in details; explain Virtual memory and Cache memory.
   2) Explain different types of memory and its use in computer.
   3) Write note on CPU.
   4) Explain instruction set of microprocessor in detail.
   5) Explain CISC ad RISC Architecture in detail.
   6) What is DMA ? Explain in detail.

Set S

SLR-VB – 183 (b)

Seat No.	

Set **P**

T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2017
(Self Learning) (New – CGPA)
OPERATING SYSTEM

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 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 alternative : **(10×1=10)**

1) Run time mapping from virtual to physical address is done by
   a) Memory management unit b) CPU
   c) PCI d) None of the mentioned

2) Physical memory is broken into fixed-sized blocks called
   a) frames b) pages c) backing store d) none of these

3) Every address generated by the CPU is divided into two parts : (choose two)
   a) frame bit b) page number c) page offset d) frame offset

4) A state is safe, if
   a) The system does not crash due to deadlock occurrence
   b) The system can allocate resources to each process in some order and still avoid a deadlock
   c) The state keeps the system protected and safe
   d) All of these

5) All unsafe states are
   a) Deadlocks
   b) Not deadlocks
   c) Fatal
   d) None of these

6) 'Aging' is
   a) Keeping track of cache contents
   b) Keeping track of what pages are currently residing in memory
   c) Keeping track of how many times a given page is referenced
   d) Increasing the priority of jobs to ensure termination in a finite time

7) The number of processes completed per unit time is known as
   a) Output
   b) Throughput
   c) Efficiency
   d) Capacity

8) The degree of multi-programming is
   a) The number of processes executed per unit time
   b) The number of processes in the ready queue
   c) The number of processes in the I/O queue
   d) The number of processes in memory

9) A process can be terminated due to
   a) Normal exit
   b) Fatal error
   c) Killed by another process
   d) All of the mentioned

10) The address of the next instruction to be executed by the current process is provided by the
   a) CPU registers
   b) Program counter
   c) Process stack
   d) Pipe

———————

SLR-VB – 183 (b)

Seat No.	

T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2017
(Self Learning) (New – CGPA)
OPERATING SYSTEM

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

2. Solve **any four** : **20**

   a) Explain process control block with diagram.

   b) Write note on :

      1) Time sharing system

      2) Personal Computer System

      3) System call.

   c) What is spooling ? Explain simple batch system.

   d) What is process ? Explain various operations on process.

   e) What is memory management ? What is difference between logical address and physical address ?

3. Solve **any two** : **20**

   a) Explain FCFS and Round Robin scheduling algorithms with example.

   b) Which are the necessary conditions for deadlock ? How will you prevent deadlock ?

   c) What is swapping ? Explain Paging in details.

Set P

SLR-VB – 183 (b)

Seat No.	

Set Q

T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2017
(Self Learning) (New – CGPA)
OPERATING SYSTEM

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 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 alternative : **(10×1=10)**

1) A process can be terminated due to
   a) Normal exit
   b) Fatal error
   c) Killed by another process
   d) All of the mentioned

2) The address of the next instruction to be executed by the current process is provided by the
   a) CPU registers b) Program counter
   c) Process stack d) Pipe

3) The number of processes completed per unit time is known as
   a) Output b) Throughput
   c) Efficiency d) Capacity

P.T.O.

4) The degree of multi-programming is
   a) The number of processes executed per unit time
   b) The number of processes in the ready queue
   c) The number of processes in the I/O queue
   d) The number of processes in memory

5) Run time mapping from virtual to physical address is done by
   a) Memory management unit b) CPU
   c) PCI d) None of the mentioned

6) Physical memory is broken into fixed-sized blocks called
   a) frames b) pages c) backing store d) none of these

7) Every address generated by the CPU is divided into two parts : (choose two)
   a) frame bit b) page number c) page offset d) frame offset

8) A state is safe, if
   a) The system does not crash due to deadlock occurrence
   b) The system can allocate resources to each process in some order and still avoid a deadlock
   c) The state keeps the system protected and safe
   d) All of these

9) All unsafe states are
   a) Deadlocks b) Not deadlocks
   c) Fatal d) None of these

10) 'Aging' is
   a) Keeping track of cache contents
   b) Keeping track of what pages are currently residing in memory
   c) Keeping track of how many times a given page is referenced
   d) Increasing the priority of jobs to ensure termination in a finite time

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SLR-VB – 183 (b)

Seat No.	

T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2017
(Self Learning) (New – CGPA)
OPERATING SYSTEM

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

2. Solve **any four** : **20**

   a) Explain process control block with diagram.

   b) Write note on :

      1) Time sharing system

      2) Personal Computer System

      3) System call.

   c) What is spooling ? Explain simple batch system.

   d) What is process ? Explain various operations on process.

   e) What is memory management ? What is difference between logical address and physical address ?

3. Solve **any two** : **20**

   a) Explain FCFS and Round Robin scheduling algorithms with example.

   b) Which are the necessary conditions for deadlock ? How will you prevent deadlock ?

   c) What is swapping ? Explain Paging in details.

Set Q

SLR-VB – 183 (b)

Seat No.	

Set **R**

T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2017
(Self Learning) (New – CGPA)
OPERATING SYSTEM

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 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 alternative : **(10×1=10)**

1) All unsafe states are
   a) Deadlocks
   b) Not deadlocks
   c) Fatal
   d) None of these

2) 'Aging' is
   a) Keeping track of cache contents
   b) Keeping track of what pages are currently residing in memory
   c) Keeping track of how many times a given page is referenced
   d) Increasing the priority of jobs to ensure termination in a finite time

3) A process can be terminated due to
   a) Normal exit
   b) Fatal error
   c) Killed by another process
   d) All of the mentioned

P.T.O.

4) The address of the next instruction to be executed by the current process is provided by the
   a) CPU registers b) Program counter
   c) Process stack d) Pipe

5) Every address generated by the CPU is divided into two parts : (choose two)
   a) frame bit b) page number c) page offset d) frame offset

6) A state is safe, if
   a) The system does not crash due to deadlock occurrence
   b) The system can allocate resources to each process in some order and still avoid a deadlock
   c) The state keeps the system protected and safe
   d) All of these

7) Run time mapping from virtual to physical address is done by
   a) Memory management unit b) CPU
   c) PCI d) None of the mentioned

8) Physical memory is broken into fixed-sized blocks called
   a) frames b) pages c) backing store d) none of these

9) The number of processes completed per unit time is known as
   a) Output b) Throughput
   c) Efficiency d) Capacity

10) The degree of multi-programming is
   a) The number of processes executed per unit time
   b) The number of processes in the ready queue
   c) The number of processes in the I/O queue
   d) The number of processes in memory

SLR-VB – 183 (b)

Seat No.	

T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2017
(Self Learning) (New – CGPA)
OPERATING SYSTEM

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

2. Solve **any four** : **20**

   a) Explain process control block with diagram.

   b) Write note on :

      1) Time sharing system

      2) Personal Computer System

      3) System call.

   c) What is spooling ? Explain simple batch system.

   d) What is process ? Explain various operations on process.

   e) What is memory management ? What is difference between logical address and physical address ?

3. Solve **any two** : **20**

   a) Explain FCFS and Round Robin scheduling algorithms with example.

   b) Which are the necessary conditions for deadlock ? How will you prevent deadlock ?

   c) What is swapping ? Explain Paging in details.

Set R

SLR-VB – 183 (b)

Seat No.	

Set **S**

T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2017
(Self Learning) (New – CGPA)
OPERATING SYSTEM

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 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 alternative : **(10×1=10)**

1) Every address generated by the CPU is divided into two parts : (choose two)
   a) frame bit
   b) page number
   c) page offset
   d) frame offset

2) A state is safe, if
   a) The system does not crash due to deadlock occurrence
   b) The system can allocate resources to each process in some order and still avoid a deadlock
   c) The state keeps the system protected and safe
   d) All of these

3) All unsafe states are
   a) Deadlocks
   b) Not deadlocks
   c) Fatal
   d) None of these

4) 'Aging' is
   a) Keeping track of cache contents
   b) Keeping track of what pages are currently residing in memory
   c) Keeping track of how many times a given page is referenced
   d) Increasing the priority of jobs to ensure termination in a finite time

5) The number of processes completed per unit time is known as
   a) Output b) Throughput c) Efficiency d) Capacity

6) The degree of multi-programming is
   a) The number of processes executed per unit time
   b) The number of processes in the ready queue
   c) The number of processes in the I/O queue
   d) The number of processes in memory

7) A process can be terminated due to
   a) Normal exit b) Fatal error
   c) Killed by another process d) All of the mentioned

8) The address of the next instruction to be executed by the current process is provided by the
   a) CPU registers b) Program counter
   c) Process stack d) Pipe

9) Run time mapping from virtual to physical address is done by
   a) Memory management unit b) CPU
   c) PCI d) None of the mentioned

10) Physical memory is broken into fixed-sized blocks called
   a) frames b) pages c) backing store d) none of these

———————

SLR-VB – 183 (b)

Seat No.	

T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2017
(Self Learning) (New – CGPA)
OPERATING SYSTEM

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

2. Solve **any four** : **20**

   a) Explain process control block with diagram.

   b) Write note on :

      1) Time sharing system

      2) Personal Computer System

      3) System call.

   c) What is spooling ? Explain simple batch system.

   d) What is process ? Explain various operations on process.

   e) What is memory management ? What is difference between logical address and physical address ?

3. Solve **any two** : **20**

   a) Explain FCFS and Round Robin scheduling algorithms with example.

   b) Which are the necessary conditions for deadlock ? How will you prevent deadlock ?

   c) What is swapping ? Explain Paging in details.

Set S

SLR-VB – 184

Seat No.	

Set **P**

T.E. (E &TC) (Part – II) (Old) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Thursday, 25-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *question 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 for following : **(20×1=20)**

1) The angle at which SCR turns ON is called as
A) Conduction angle B) Firing angle
C) Extinction angle D) None

2) Which one of following is greater ?
A) Leakage current B) Holding current
C) Latching current D) None

3) Converters use _____ to control output voltage.
A) Phase angle control B) Natural commutation
C) PWM D) Forced commutation

4) A cyclo converter is _____ converter.
A) Ac-dc B) Dc-ac C) Dc-dc D) Ac-ac

5) The commutation method in an inverter is
A) Line commutation B) Forced commutation
C) Either Line or forced D) None

6) Step down DC chopper is operating from 200 V dc and duty cycle is 40%. The average load voltage is _____ V.
A) 80 B) 800 C) 8 D) 0.8

7) The no. of PN junction in SCR is
A) One B) Two C) Three D) Four

8) An UJT exhibits negative resistance region
A) Before peak point B) Between peak and valley point
C) After the valley point D) None

9) In 3 phase full wave converter, the frequency of ripple in output is
   A) Input frequency B) Double the Input frequency
   C) Three times the Input frequency D) Six times the Input frequency

10) Jones chopper uses _____ commutation.
   A) Natural B) Self
   C) Auxiliary D) Complimentary

11) The ON state voltage drop across an SCR operated from 250 V supply is
   A) A 10 to 11 V B) A 24 to 25 V C) A 1 to 1.5 V D) A 0.2 to 0.5 V

12) 1 phase fully controlled converter with resistive load operates in _____ quadrant.
   A) One B) Two C) One and Two D) Four

13) TRIAC with MT2 positive w.r.t. MT1 can be triggered by
   A) Positive gate signal B) Negative gate signal
   C) Positive or negative gate signal D) None

14) Inductor is used for _____ protection of SCR.
   A) Over current B) Overvoltage
   C) Rate of change of voltage dV/dt D) Rate of change of current di/dt

15) Using Morgan's chopper _____ time ratio control is supported.
   A) Fixed frequency B) Variable frequency
   C) Fixed and variable frequency D) CLC

16) In 1 phase half wave converter, if input voltage is 230 V, 50 Hz and average load voltage is 96.6 V, then the firing angle is
   A) Thirty degrees B) Forty degrees
   C) Forty five degrees D) Sixty degrees

17) Which of following output voltage control method gives minimum harmonics in output of inverter ?
   A) Single PWM B) Multiple PWM
   C) Sinusoidal PWM D) Modified sinusoidal PWM

18) How many power devices will conduct at any time in three phase 120 degree mode inverter ?
   A) One B) Two C) Three D) Four

19) Which circuit is used for speed control of DC motor ?
   A) Controlled rectifier B) Inverter
   C) Cyclo converter D) None

20) Induction heating is used for heating
   A) Metals B) Insulators C) Both A) and B) D) None

_____

SLR-VB – 184

Seat No.	

T.E. (E &TC) (Part – II) (Old) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Thursday, 25-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Solve **any four** : **16**
   a) Draw and explain VI characteristics of SCR.
   b) Explain complimentary commutation.
   c) Explain over current and over voltage protection for SCR.
   d) Explain Lamp dimmer circuit.
   e) Explain half wave controlled rectifier with resistive load.

3. Solve **any three** : **24**
   a) Draw and explain line synchronized UJT firing circuit.
   b) With the help of construction diagram explain operation of TRIAC in various operating modes.
   c) Explain single phase fully controlled bridge rectifier with resistive load. Derive expression for Average load voltage.
   d) Explain three phase half wave controlled rectifier with resistive load.

SECTION – II

4. Solve **any four** : **16**
   a) Explain series Inverter.
   b) Explain the principle of step down cyclo converter.
   c) Explain principle of step down chopper and derive expression for average load voltage.
   d) What is Online UPS ? Explain with block diagram.
   e) Explain chopper control techniques ?

5. Solve **any three** : **24**

a) Explain operation of three phase bridge inverter in 120° mode with resistive load. Draw necessary Waveforms.

b) How choppers are classified ? Explain Morgan's chopper.

c) Explain the principle of Induction heating. What are its applications ? Explain any one.

d) Explain single phase separately excited DC motor drive.

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SLR-VB – 184

Seat No.	

Set Q

T.E. (E &TC) (Part – II) (Old) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Thursday, 25-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) **All** question 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 for following : **(20×1=20)**

1) In 1 phase half wave converter, if input voltage is 230 V, 50 Hz and average load voltage is 96.6 V, then the firing angle is
A) Thirty degrees B) Forty degrees
C) Forty five degrees D) Sixty degrees

2) Which of following output voltage control method gives minimum harmonics in output of inverter ?
A) Single PWM B) Multiple PWM
C) Sinusoidal PWM D) Modified sinusoidal PWM

3) How many power devices will conduct at any time in three phase 120 degree mode inverter ?
A) One B) Two C) Three D) Four

4) Which circuit is used for speed control of DC motor ?
A) Controlled rectifier B) Inverter
C) Cyclo converter D) None

5) Induction heating is used for heating
A) Metals B) Insulators C) Both A) and B) D) None

6) The angle at which SCR turns ON is called as
A) Conduction angle B) Firing angle
C) Extinction angle D) None

7) Which one of following is greater ?
A) Leakage current B) Holding current
C) Latching current D) None

P.T.O.

8) Converters use _____ to control output voltage.
   A) Phase angle control B) Natural commutation
   C) PWM D) Forced commutation

9) A cyclo converter is _____ converter.
   A) Ac-dc B) Dc-ac C) Dc-dc D) Ac-ac

10) The commutation method in an inverter is
   A) Line commutation B) Forced commutation
   C) Either Line or forced D) None

11) Step down DC chopper is operating from 200 V dc and duty cycle is 40%. The average load voltage is _____ V.
   A) 80 B) 800 C) 8 D) 0.8

12) The no. of PN junction in SCR is
   A) One B) Two C) Three D) Four

13) An UJT exhibits negative resistance region
   A) Before peak point B) Between peak and valley point
   C) After the valley point D) None

14) In 3 phase full wave converter, the frequency of ripple in output is
   A) Input frequency B) Double the Input frequency
   C) Three times the Input frequency D) Six times the Input frequency

15) Jones chopper uses _____ commutation.
   A) Natural B) Self
   C) Auxiliary D) Complimentary

16) The ON state voltage drop across an SCR operated from 250 V supply is
   A) A 10 to 11 V B) A 24 to 25 V C) A 1 to 1.5 V D) A 0.2 to 0.5 V

17) 1 phase fully controlled converter with resistive load operates in _____ quadrant.
   A) One B) Two C) One and Two D) Four

18) TRIAC with MT2 positive w.r.t. MT1 can be triggered by
   A) Positive gate signal B) Negative gate signal
   C) Positive or negative gate signal D) None

19) Inductor is used for _____ protection of SCR.
   A) Over current B) Overvoltage
   C) Rate of change of voltage dV/dt D) Rate of change of current di/dt

20) Using Morgan's chopper _____ time ratio control is supported.
   A) Fixed frequency B) Variable frequency
   C) Fixed and variable frequency D) CLC

_____

SLR-VB – 184

Seat No.	

T.E. (E &TC) (Part – II) (Old) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Thursday, 25-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Solve **any four** : **16**
   a) Draw and explain VI characteristics of SCR.
   b) Explain complimentary commutation.
   c) Explain over current and over voltage protection for SCR.
   d) Explain Lamp dimmer circuit.
   e) Explain half wave controlled rectifier with resistive load.

3. Solve **any three** : **24**
   a) Draw and explain line synchronized UJT firing circuit.
   b) With the help of construction diagram explain operation of TRIAC in various operating modes.
   c) Explain single phase fully controlled bridge rectifier with resistive load. Derive expression for Average load voltage.
   d) Explain three phase half wave controlled rectifier with resistive load.

SECTION – II

4. Solve **any four** : **16**
   a) Explain series Inverter.
   b) Explain the principle of step down cyclo converter.
   c) Explain principle of step down chopper and derive expression for average load voltage.
   d) What is Online UPS ? Explain with block diagram.
   e) Explain chopper control techniques ?

Set Q

5. Solve **any three** : **24**

a) Explain operation of three phase bridge inverter in 120° mode with resistive load. Draw necessary Waveforms.

b) How choppers are classified ? Explain Morgan's chopper.

c) Explain the principle of Induction heating. What are its applications ? Explain any one.

d) Explain single phase separately excited DC motor drive.

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SLR-VB – 184

Seat No.	

Set **R**

T.E. (E &TC) (Part – II) (Old) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Thursday, 25-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *question 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 for following : **(20×1=20)**

1) The ON state voltage drop across an SCR operated from 250 V supply is
A) A 10 to 11 V B) A 24 to 25 V C) A 1 to 1.5 V D) A 0.2 to 0.5 V

2) 1 phase fully controlled converter with resistive load operates in _____ quadrant.
A) One B) Two C) One and Two D) Four

3) TRIAC with MT2 positive w.r.t. MT1 can be triggered by
A) Positive gate signal B) Negative gate signal
C) Positive or negative gate signal D) None

4) Inductor is used for _____ protection of SCR.
A) Over current B) Overvoltage
C) Rate of change of voltage dV/dt D) Rate of change of current di/dt

5) Using Morgan's chopper _____ time ratio control is supported.
A) Fixed frequency B) Variable frequency
C) Fixed and variable frequency D) CLC

6) In 1 phase half wave converter, if input voltage is 230 V, 50 Hz and average load voltage is 96.6 V, then the firing angle is
A) Thirty degrees B) Forty degrees
C) Forty five degrees D) Sixty degrees

7) Which of following output voltage control method gives minimum harmonics in output of inverter ?
A) Single PWM B) Multiple PWM
C) Sinusoidal PWM D) Modified sinusoidal PWM

8) How many power devices will conduct at any time in three phase 120 degree mode inverter ?
A) One B) Two C) Three D) Four

9) Which circuit is used for speed control of DC motor ?
A) Controlled rectifier B) Inverter
C) Cyclo converter D) None

10) Induction heating is used for heating
A) Metals B) Insulators C) Both A) and B) D) None

11) The angle at which SCR turns ON is called as
A) Conduction angle B) Firing angle
C) Extinction angle D) None

12) Which one of following is greater ?
A) Leakage current B) Holding current
C) Latching current D) None

13) Converters use _____ to control output voltage.
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C) PWM D) Forced commutation

14) A cyclo converter is _____ converter.
A) Ac-dc B) Dc-ac C) Dc-dc D) Ac-ac

15) The commutation method in an inverter is
A) Line commutation B) Forced commutation
C) Either Line or forced D) None

16) Step down DC chopper is operating from 200 V dc and duty cycle is 40%. The average load voltage is _____ V.
A) 80 B) 800 C) 8 D) 0.8

17) The no. of PN junction in SCR is
A) One B) Two C) Three D) Four

18) An UJT exhibits negative resistance region
A) Before peak point B) Between peak and valley point
C) After the valley point D) None

19) In 3 phase full wave converter, the frequency of ripple in output is
A) Input frequency B) Double the Input frequency
C) Three times the Input frequency D) Six times the Input frequency

20) Jones chopper uses _____ commutation.
A) Natural B) Self
C) Auxiliary D) Complimentary

_____

SLR-VB – 184

Seat No.	

T.E. (E &TC) (Part – II) (Old) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Thursday, 25-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Solve **any four** : **16**
   a) Draw and explain VI characteristics of SCR.
   b) Explain complimentary commutation.
   c) Explain over current and over voltage protection for SCR.
   d) Explain Lamp dimmer circuit.
   e) Explain half wave controlled rectifier with resistive load.

3. Solve **any three** : **24**
   a) Draw and explain line synchronized UJT firing circuit.
   b) With the help of construction diagram explain operation of TRIAC in various operating modes.
   c) Explain single phase fully controlled bridge rectifier with resistive load. Derive expression for Average load voltage.
   d) Explain three phase half wave controlled rectifier with resistive load.

SECTION – II

4. Solve **any four** : **16**
   a) Explain series Inverter.
   b) Explain the principle of step down cyclo converter.
   c) Explain principle of step down chopper and derive expression for average load voltage.
   d) What is Online UPS ? Explain with block diagram.
   e) Explain chopper control techniques ?

Set R

5. Solve **any three** : **24**

a) Explain operation of three phase bridge inverter in 120° mode with resistive load. Draw necessary Waveforms.

b) How choppers are classified ? Explain Morgan's chopper.

c) Explain the principle of Induction heating. What are its applications ? Explain any one.

d) Explain single phase separately excited DC motor drive.

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SLR-VB – 184

Seat No.	

Set **S**

T.E. (E &TC) (Part – II) (Old) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Thursday, 25-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *question 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 for following : **(20×1=20)**

1) Step down DC chopper is operating from 200 V dc and duty cycle is 40%. The average load voltage is _____ V.
A) 80 B) 800 C) 8 D) 0.8

2) The no. of PN junction in SCR is
A) One B) Two C) Three D) Four

3) An UJT exhibits negative resistance region
A) Before peak point B) Between peak and valley point
C) After the valley point D) None

4) In 3 phase full wave converter, the frequency of ripple in output is
A) Input frequency B) Double the Input frequency
C) Three times the Input frequency D) Six times the Input frequency

5) Jones chopper uses _____ commutation.
A) Natural B) Self
C) Auxiliary D) Complimentary

6) The ON state voltage drop across an SCR operated from 250 V supply is
A) A 10 to 11 V B) A 24 to 25 V C) A 1 to 1.5 V D) A 0.2 to 0.5 V

7) 1 phase fully controlled converter with resistive load operates in _____ quadrant.
A) One B) Two C) One and Two D) Four

8) TRIAC with MT2 positive w.r.t. MT1 can be triggered by
A) Positive gate signal B) Negative gate signal
C) Positive or negative gate signal D) None

9) Inductor is used for _____ protection of SCR.
   A) Over current B) Overvoltage
   C) Rate of change of voltage dV/dt D) Rate of change of current di/dt

10) Using Morgan's chopper _____ time ratio control is supported.
   A) Fixed frequency B) Variable frequency
   C) Fixed and variable frequency D) CLC

11) In 1 phase half wave converter, if input voltage is 230 V, 50 Hz and average load voltage is 96.6 V, then the firing angle is
   A) Thirty degrees B) Forty degrees
   C) Forty five degrees D) Sixty degrees

12) Which of following output voltage control method gives minimum harmonics in output of inverter ?
   A) Single PWM B) Multiple PWM
   C) Sinusoidal PWM D) Modified sinusoidal PWM

13) How many power devices will conduct at any time in three phase 120 degree mode inverter ?
   A) One B) Two C) Three D) Four

14) Which circuit is used for speed control of DC motor ?
   A) Controlled rectifier B) Inverter
   C) Cyclo converter D) None

15) Induction heating is used for heating
   A) Metals B) Insulators C) Both A) and B) D) None

16) The angle at which SCR turns ON is called as
   A) Conduction angle B) Firing angle
   C) Extinction angle D) None

17) Which one of following is greater ?
   A) Leakage current B) Holding current
   C) Latching current D) None

18) Converters use _____ to control output voltage.
   A) Phase angle control B) Natural commutation
   C) PWM D) Forced commutation

19) A cyclo converter is _____ converter.
   A) Ac-dc B) Dc-ac C) Dc-dc D) Ac-ac

20) The commutation method in an inverter is
   A) Line commutation B) Forced commutation
   C) Either Line or forced D) None

_____

SLR-VB – 184

Seat No.	

T.E. (E &TC) (Part – II) (Old) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Thursday, 25-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Solve **any four** : **16**
   a) Draw and explain VI characteristics of SCR.
   b) Explain complimentary commutation.
   c) Explain over current and over voltage protection for SCR.
   d) Explain Lamp dimmer circuit.
   e) Explain half wave controlled rectifier with resistive load.

3. Solve **any three** : **24**
   a) Draw and explain line synchronized UJT firing circuit.
   b) With the help of construction diagram explain operation of TRIAC in various operating modes.
   c) Explain single phase fully controlled bridge rectifier with resistive load. Derive expression for Average load voltage.
   d) Explain three phase half wave controlled rectifier with resistive load.

SECTION – II

4. Solve **any four** : **16**
   a) Explain series Inverter.
   b) Explain the principle of step down cyclo converter.
   c) Explain principle of step down chopper and derive expression for average load voltage.
   d) What is Online UPS ? Explain with block diagram.
   e) Explain chopper control techniques ?

5. Solve **any three** : **24**

a) Explain operation of three phase bridge inverter in 120° mode with resistive load. Draw necessary Waveforms.

b) How choppers are classified ? Explain Morgan's chopper.

c) Explain the principle of Induction heating. What are its applications ? Explain any one.

d) Explain single phase separately excited DC motor drive.

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SLR-VB – 185

Seat No.	

Set **P**

B.E. (E and TC) (Part – I) Examination, 2017
COMPUTER COMMUNICATION NETWORK

Day and Date : Thursday, 4-5-2017 Total 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 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 : 20

1. Select the correct option :

1) Physical or logical arrangement of network is
A) Topology B) Routing
C) Networking D) None of the mentioned

2) This topology requires multipoint connection
A) Star B) Mesh C) Ring D) Bus

3) In the OSI model, as a data packet moves from the lower to the upper layers, headers are
A) Added B) Removed C) Rearranged D) Modified

4) To deliver a message to the correct application program running on a host, the _____ address must be consulted.
A) Port B) IP C) Physical D) None of the above

5) Ethernet uses a _____ physical address that is imprinted on network interface card NIC.
A) 32 bit B) 64 bit C) 6 byte D) None of the above

6) Identify the class of the following IP address : 14.5.8.2.
A) Class A B) Class B C) Class C D) None of the above

7) TCP assigns a sequence number to each segment that is being sent. The sequence number for each segment is the number of the _____ byte carried in that segment.
A) Middle B) Last C) First D) None of these

8) What is the default mask for class C in CIDR notation ?
A) /24 B) /8 C) /16 D) None of these

9) When a datagram is encapsulated in a frame, the total size of the datagram must be less than the _____
A) MAT B) MUT C) MTU D) None of these

10) The term _____ means that IP provides no error checking or tracking. IP assumes the unreliability of the underlying layers and does its best to get a transmission through to its destination, but with no guarantees.
A) Reliable delivery B) Connection – oriented delivery
C) Best-effort delivery D) None of these

11) A technique called _____ is used to create a subneting effect.
A) ARP B) RARP C) Proxy ARP D) None of these

12) Which of the following types of connections can use full duplex ?
1) Hub to hub
2) Switch to switch
3) Host to host
4) Switch to hub
5) Switch to host
A) 1, 2 and 4 B) 3 and 4 C) 3 and 5 D) 2, 3 and 5

13) One method to alert a source host of congestion is the _____ message.
A) Echo request B) Redirection C) Source-quench D) None of these

14) TFTP uses _____ error control mechanism.
A) Checksum B) Hamming code
C) Symmetric with time outs D) Asymmetric with time outs

15) The _____ translates internet domain and host names to IP address.
A) Domain name system B) Routing information protocol
C) Network time protocol D) Internet relay chat

16) Which one of the following is not an application layer protocol ?
A) Media gateway protocol B) Dynamic host configuration protocol
C) Resource reservation protocol D) Session initiation protocol

17) When displaying a web page, the application layer uses the _____ protocol.
A) HTTP B) FTP
C) SMTP D) None of the mentioned

18) _____ identifies terminating devices such as terminals and computers.
A) DTE B) DCE C) CSU D) DSU

19) Learning network addresses and converting frame formats are the function of which device ?
A) Switch B) Hub C) MAU D) Bridge

20) Which type of routing allows each node to maintain its own routing table ?
A) Distributive B) Adaptive C) Centralized D) Static

_____

SLR-VB – 185

Seat No.	

B.E. (E and TC) (Part – I) Examination, 2017
COMPUTER COMMUNICATION NETWORK

Day and Date : Thursday, 4-5-2017 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** : **(4×5=20)**
   1) Draw and explain RS232 interfacing sequences.
   2) How frame boundaries are decided ? Explain in short different framing techniques.
   3) Describe how flow control occurs at data link layer.
   4) Draw and explain mode transition diagram in HDLC.
   5) What sequences are followed for half duplex communication (Half Close Handshaking) in case of TCP ?

3. Attempt **any two** : **(2×10=20)**
   a) Explain in details with examples how error detection is achieved using following techniques.
      i) CRC
      ii) Block Parity.
   b) Draw and explain different network topologies along with its advantages and disadvantages.
   c) Explain in detail collision free and collision oriented protocols in MAC.

SECTION – II

4. Solve **any four** : **(4×5=20)**
   1) Explain shortest path routing with an example.
   2) Draw block diagram of Modem. Explain function of each block.
   3) How ARP resolves the IP address into MAC addresses ?
   4) Which sequences are followed in FTP for transfer of a file ?
   5) What is zone and domain in DNS ? Draw and explain different domains in DNS.

5. Attempt **any two** : **(2×10=20)**

   a) Explain architecture of EMail using four scenarios which includes User Agents (UA), Message Transfer Agents (MTA) and Message Access Agents (MAA).

   b) Draw and explain DHCP packet format and explain each field in detail.

   c) Explain ICMP along with its different message types.

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SLR-VB – 185

Seat No.	

Set **Q**

B.E. (E and TC) (Part – I) Examination, 2017
COMPUTER COMMUNICATION NETWORK

Day and Date : Thursday, 4-5-2017 Total 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.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Select the correct option :

1) Which one of the following is not an application layer protocol ?
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2) When displaying a web page, the application layer uses the _____ protocol.
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7) This topology requires multipoint connection
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P.T.O.

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15) The term _____ means that IP provides no error checking or tracking. IP assumes the unreliability of the underlying layers and does its best to get a transmission through to its destination, but with no guarantees.
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3) Host to host
4) Switch to hub
5) Switch to host
A) 1, 2 and 4 B) 3 and 4 C) 3 and 5 D) 2, 3 and 5

18) One method to alert a source host of congestion is the _____ message.
A) Echo request B) Redirection C) Source-quench D) None of these

19) TFTP uses _____ error control mechanism.
A) Checksum B) Hamming code
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20) The _____ translates internet domain and host names to IP address.
A) Domain name system B) Routing information protocol
C) Network time protocol D) Internet relay chat

_____

SLR-VB – 185

Seat No.	

B.E. (E and TC) (Part – I) Examination, 2017
COMPUTER COMMUNICATION NETWORK

Day and Date : Thursday, 4-5-2017 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** : **(4×5=20)**
   1) Draw and explain RS232 interfacing sequences.
   2) How frame boundaries are decided ? Explain in short different framing techniques.
   3) Describe how flow control occurs at data link layer.
   4) Draw and explain mode transition diagram in HDLC.
   5) What sequences are followed for half duplex communication (Half Close Handshaking) in case of TCP ?

3. Attempt **any two** : **(2×10=20)**
   a) Explain in details with examples how error detection is achieved using following techniques.
      i) CRC
      ii) Block Parity.
   b) Draw and explain different network topologies along with its advantages and disadvantages.
   c) Explain in detail collision free and collision oriented protocols in MAC.

SECTION – II

4. Solve **any four** : **(4×5=20)**
   1) Explain shortest path routing with an example.
   2) Draw block diagram of Modem. Explain function of each block.
   3) How ARP resolves the IP address into MAC addresses ?
   4) Which sequences are followed in FTP for transfer of a file ?
   5) What is zone and domain in DNS ? Draw and explain different domains in DNS.

Set Q

5. Attempt **any two** : **(2×10=20)**

   a) Explain architecture of EMail using four scenarios which includes User Agents (UA), Message Transfer Agents (MTA) and Message Access Agents (MAA).

   b) Draw and explain DHCP packet format and explain each field in detail.

   c) Explain ICMP along with its different message types.

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SLR-VB – 185

Seat No.	

Set **R**

B.E. (E and TC) (Part – I) Examination, 2017
COMPUTER COMMUNICATION NETWORK

Day and Date : Thursday, 4-5-2017 Total 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 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 : 20

1. Select the correct option :

1) A technique called _____ is used to create a subneting effect.
A) ARP B) RARP C) Proxy ARP D) None of these

2) Which of the following types of connections can use full duplex ?
1) Hub to hub
2) Switch to switch
3) Host to host
4) Switch to hub
5) Switch to host
A) 1, 2 and 4 B) 3 and 4 C) 3 and 5 D) 2, 3 and 5

3) One method to alert a source host of congestion is the _____ message.
A) Echo request B) Redirection C) Source-quench D) None of these

4) TFTP uses _____ error control mechanism.
A) Checksum B) Hamming code
C) Symmetric with time outs D) Asymmetric with time outs

5) The _____ translates internet domain and host names to IP address.
A) Domain name system B) Routing information protocol
C) Network time protocol D) Internet relay chat

6) Which one of the following is not an application layer protocol ?
A) Media gateway protocol B) Dynamic host configuration protocol
C) Resource reservation protocol D) Session initiation protocol

P.T.O.

7) When displaying a web page, the application layer uses the _____ protocol.
A) HTTP B) FTP
C) SMTP D) None of the mentioned

8) _____ identifies terminating devices such as terminals and computers.
A) DTE B) DCE C) CSU D) DSU

9) Learning network addresses and converting frame formats are the function of which device ?
A) Switch B) Hub C) MAU D) Bridge

10) Which type of routing allows each node to maintain its own routing table ?
A) Distributive B) Adaptive C) Centralized D) Static

11) Physical or logical arrangement of network is
A) Topology B) Routing
C) Networking D) None of the mentioned

12) This topology requires multipoint connection
A) Star B) Mesh C) Ring D) Bus

13) In the OSI model, as a data packet moves from the lower to the upper layers, headers are
A) Added B) Removed C) Rearranged D) Modified

14) To deliver a message to the correct application program running on a host, the _____ address must be consulted.
A) Port B) IP C) Physical D) None of the above

15) Ethernet uses a _____ physical address that is imprinted on network interface card NIC.
A) 32 bit B) 64 bit C) 6 byte D) None of the above

16) Identify the class of the following IP address : 14.5.8.2.
A) Class A B) Class B C) Class C D) None of the above

17) TCP assigns a sequence number to each segment that is being sent. The sequence number for each segment is the number of the _____ byte carried in that segment.
A) Middle B) Last C) First D) None of these

18) What is the default mask for class C in CIDR notation ?
A) /24 B) /8 C) /16 D) None of these

19) When a datagram is encapsulated in a frame, the total size of the datagram must be less than the _____
A) MAT B) MUT C) MTU D) None of these

20) The term _____ means that IP provides no error checking or tracking. IP assumes the unreliability of the underlying layers and does its best to get a transmission through to its destination, but with no guarantees.
A) Reliable delivery B) Connection – oriented delivery
C) Best-effort delivery D) None of these

_____

SLR-VB – 185

Seat No.	

B.E. (E and TC) (Part – I) Examination, 2017
COMPUTER COMMUNICATION NETWORK

Day and Date : Thursday, 4-5-2017 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** : **(4×5=20)**
   1) Draw and explain RS232 interfacing sequences.
   2) How frame boundaries are decided ? Explain in short different framing techniques.
   3) Describe how flow control occurs at data link layer.
   4) Draw and explain mode transition diagram in HDLC.
   5) What sequences are followed for half duplex communication (Half Close Handshaking) in case of TCP ?

3. Attempt **any two** : **(2×10=20)**
   a) Explain in details with examples how error detection is achieved using following techniques.
      i) CRC
      ii) Block Parity.
   b) Draw and explain different network topologies along with its advantages and disadvantages.
   c) Explain in detail collision free and collision oriented protocols in MAC.

SECTION – II

4. Solve **any four** : **(4×5=20)**
   1) Explain shortest path routing with an example.
   2) Draw block diagram of Modem. Explain function of each block.
   3) How ARP resolves the IP address into MAC addresses ?
   4) Which sequences are followed in FTP for transfer of a file ?
   5) What is zone and domain in DNS ? Draw and explain different domains in DNS.

5. Attempt **any two** : **(2×10=20)**

   a) Explain architecture of EMail using four scenarios which includes User Agents (UA), Message Transfer Agents (MTA) and Message Access Agents (MAA).

   b) Draw and explain DHCP packet format and explain each field in detail.

   c) Explain ICMP along with its different message types.

SLR-VB – 185

Seat No.	

Set **S**

B.E. (E and TC) (Part – I) Examination, 2017
COMPUTER COMMUNICATION NETWORK

Day and Date : Thursday, 4-5-2017 Total 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 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 : 20

1. Select the correct option :

1) Identify the class of the following IP address : 14.5.8.2.
A) Class A B) Class B C) Class C D) None of the above

2) TCP assigns a sequence number to each segment that is being sent. The sequence number for each segment is the number of the _____ byte carried in that segment.
A) Middle B) Last C) First D) None of these

3) What is the default mask for class C in CIDR notation ?
A) /24 B) /8 C) /16 D) None of these

4) When a datagram is encapsulated in a frame, the total size of the datagram must be less than the _____
A) MAT B) MUT
C) MTU D) None of these

5) The term _____ means that IP provides no error checking or tracking. IP assumes the unreliability of the underlying layers and does its best to get a transmission through to its destination, but with no guarantees.
A) Reliable delivery B) Connection – oriented delivery
C) Best-effort delivery D) None of these

6) A technique called _____ is used to create a subneting effect.
A) ARP B) RARP
C) Proxy ARP D) None of these

P.T.O.

7) Which of the following types of connections can use full duplex ?
   1) Hub to hub
   2) Switch to switch
   3) Host to host
   4) Switch to hub
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   A) 1, 2 and 4 B) 3 and 4 C) 3 and 5 D) 2, 3 and 5

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   A) Echo request B) Redirection C) Source-quench D) None of these

9) TFTP uses _____ error control mechanism.
   A) Checksum B) Hamming code
   C) Symmetric with time outs D) Asymmetric with time outs

10) The _____ translates internet domain and host names to IP address.
   A) Domain name system B) Routing information protocol
   C) Network time protocol D) Internet relay chat

11) Which one of the following is not an application layer protocol ?
   A) Media gateway protocol B) Dynamic host configuration protocol
   C) Resource reservation protocol D) Session initiation protocol

12) When displaying a web page, the application layer uses the _____ protocol.
   A) HTTP B) FTP
   C) SMTP D) None of the mentioned

13) _____ identifies terminating devices such as terminals and computers.
   A) DTE B) DCE C) CSU D) DSU

14) Learning network addresses and converting frame formats are the function of which device ?
   A) Switch B) Hub C) MAU D) Bridge

15) Which type of routing allows each node to maintain its own routing table ?
   A) Distributive B) Adaptive C) Centralized D) Static

16) Physical or logical arrangement of network is
   A) Topology B) Routing C) Networking D) None of the mentioned

17) This topology requires multipoint connection
   A) Star B) Mesh C) Ring D) Bus

18) In the OSI model, as a data packet moves from the lower to the upper layers, headers are
   A) Added B) Removed C) Rearranged D) Modified

19) To deliver a message to the correct application program running on a host, the _____ address must be consulted.
   A) Port B) IP C) Physical D) None of the above

20) Ethernet uses a _____ physical address that is imprinted on network interface card NIC.
   A) 32 bit B) 64 bit C) 6 byte D) None of the above

_____

SLR-VB – 185

Seat No.	

B.E. (E and TC) (Part – I) Examination, 2017
COMPUTER COMMUNICATION NETWORK

Day and Date : Thursday, 4-5-2017 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** : **(4×5=20)**
   1) Draw and explain RS232 interfacing sequences.
   2) How frame boundaries are decided ? Explain in short different framing techniques.
   3) Describe how flow control occurs at data link layer.
   4) Draw and explain mode transition diagram in HDLC.
   5) What sequences are followed for half duplex communication (Half Close Handshaking) in case of TCP ?

3. Attempt **any two** : **(2×10=20)**
   a) Explain in details with examples how error detection is achieved using following techniques.
      i) CRC
      ii) Block Parity.
   b) Draw and explain different network topologies along with its advantages and disadvantages.
   c) Explain in detail collision free and collision oriented protocols in MAC.

SECTION – II

4. Solve **any four** : **(4×5=20)**
   1) Explain shortest path routing with an example.
   2) Draw block diagram of Modem. Explain function of each block.
   3) How ARP resolves the IP address into MAC addresses ?
   4) Which sequences are followed in FTP for transfer of a file ?
   5) What is zone and domain in DNS ? Draw and explain different domains in DNS.

5. Attempt **any two** : **(2×10=20)**

   a) Explain architecture of EMail using four scenarios which includes User Agents (UA), Message Transfer Agents (MTA) and Message Access Agents (MAA).

   b) Draw and explain DHCP packet format and explain each field in detail.

   c) Explain ICMP along with its different message types.

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SLR-VB – 186

Seat No.	

Set **P**

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
VLSI DESIGN

Day and Date : Friday, 5-5-2017 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) The ability to tolerate noise without affecting correct operation of the circuit is called
   a) Dynamic power dissipation b) Noise margin
   c) Static power dissipation d) None of the above

2) Process in VHDL becomes active, when
   a) There is change in the value of signal in sensitivity list
   b) Change in clock statement
   c) Change in reset signal
   d) None of the above

3) The symbol _____ is the signal assignment operator.
   a) : = b) < = c) = > d) None of the above

4) In std_logic, high impedance is represented by
   a) 'Z' b) 'H' c) 'W' d) 'X'

5) In an entity, buffer is a
   a) Signal type b) Signal mode
   c) Signal port d) None of the above

6) _____ is a sequential statement.
   a) If-else b) Loop
   c) Case d) All of the above

7) A ripple counter is _____ sequential circuit
   a) Reset b) Synchronous c) Asynchronous d) None of the above

8) Which of the following input combination is not allowed in SR flip-flop ?
   a) S = 0, R = 0 b) S = 0, R = 1 c) S = 1, R = 0 d) S = 1, R = 1

P.T.O.

9) Flip-flop can store
   a) One bit of data
   b) Two bits of data
   c) Three bits of data
   d) All of the above

10) _____ power dissipation occurs due to charging and discharging of load capacitance.
   a) Static b) Dynamic c) Noise d) None of the above

11) In Mealy circuit, the outputs depend only on
   a) Present state
   b) Present state, input
   c) Input
   d) None of the above

12) Sequential circuits often have external inputs that are asynchronous, input changes can cause temporary false values called _____ at the output and the next states.
   a) Glitch
   b) Clock skew
   c) Hazard
   d) None of the above

13) Most look up tables in FPGAs use _____ inputs, resulting in ____ possible outputs.
   a) 4, 16 b) 8, 16 c) 4, 12 d) 6, 12

14) Boundary scan is an IEEE _____ standard.
   a) 1149
   b) 1164
   c) 1096
   d) None of the above

15) Built in Self Test is used for
   a) Testing components
   b) Testing flip-flops
   c) Testing memory
   d) None of the above

16) Slices are available in
   a) CPLD b) FPGA c) ASIC d) All of the above

17) A test bunch is used to
   a) Verify the functionality of a design
   b) To generate primitives
   c) To generate netlist
   d) None of the above

18) CPLD features a _____ type of memory.
   a) Volatile
   b) Non-volatile
   c) EPROM
   d) Volatile EPROM

19) FLEX 10K contains
   a) LABs
   b) EABs
   c) Both a) and b)
   d) None of the above

20) Stuck at fault is generated when
   a) An input to gate is incorrectly connected to power supply
   b) Input between gate is incorrectly connected
   c) Both a) and b)
   d) None of the above

_____

SLR-VB – 186

Seat No.	

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
VLSI DESIGN

Day and Date : Friday, 5-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

2. Solve **any four** : **16**
   a) Realize NOR gate using CMOS logic.
   b) Explain package with the help of syntax.
   c) Write the syntax for entity and architecture.
   d) Explain switching characteristics of CMOS inverter.
   e) Write a VHDL code for SR flip flop.

3. Solve the following : **24**
   a) Explain static and dynamic power dissipation. Derive and expression for total power dissipation.
   b) Write VHDL code for 4 bit up/down counter with synchronous and asynchronous reset.
   c) Explain various attributes in VHDL.

   OR

   c) Write a VHDL code for 4 bit adder using generate statement.

4. Solve **any four** : **16**
   a) Draw and explain Altera MAX 7000.
   b) Differentiate between CPLD and FPGA architectures.
   c) Write a VHDL code to detect a sequence 101.
   d) Explain Built-in-self-test with the help of neat diagram.
   e) Write down test bench for 1 : 4 demultiplexer.

5. Solve the following : **24**
   a) Draw and explain architecture of Altera flex 10K.
   b) Write a VHDL code for traffic light controller.
   c) Explain with the help of example testing of combinational logic.

   OR

   c) Explain boundary scan architecture with the help of diagram.

Set P

Set P

SLR-VB – 186

Seat No.	

Set **Q**

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
VLSI DESIGN

Day and Date : Friday, 5-5-2017 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) Slices are available in
   a) CPLD b) FPGA c) ASIC d) All of the above

2) A test bunch is used to
   a) Verify the functionality of a design b) To generate primitives
   c) To generate netlist d) None of the above

3) CPLD features a _____ type of memory.
   a) Volatile b) Non-volatile
   c) EPROM d) Volatile EPROM

4) FLEX 10K contains
   a) LABs b) EABs
   c) Both a) and b) d) None of the above

5) Stuck at fault is generated when
   a) An input to gate is incorrectly connected to power supply
   b) Input between gate is incorrectly connected
   c) Both a) and b)
   d) None of the above

6) The ability to tolerate noise without affecting correct operation of the circuit is called
   a) Dynamic power dissipation b) Noise margin
   c) Static power dissipation d) None of the above

7) Process in VHDL becomes active, when
   a) There is change in the value of signal in sensitivity list
   b) Change in clock statement
   c) Change in reset signal
   d) None of the above

P.T.O.

8) The symbol _____ is the signal assignment operator.
   a) : = b) < = c) = > d) None of the above

9) In std_logic, high impedance is represented by
   a) 'Z' b) 'H' c) 'W' d) 'X'

10) In an entity, buffer is a
   a) Signal type b) Signal mode
   c) Signal port d) None of the above

11) _____ is a sequential statement.
   a) If-else b) Loop
   c) Case d) All of the above

12) A ripple counter is _____ sequential circuit
   a) Reset b) Synchronous c) Asynchronous d) None of the above

13) Which of the following input combination is not allowed in SR flip-flop ?
   a) S = 0, R = 0 b) S = 0, R = 1 c) S = 1, R = 0 d) S = 1, R = 1

14) Flip-flop can store
   a) One bit of data b) Two bits of data
   c) Three bits of data d) All of the above

15) _____ power dissipation occurs due to charging and discharging of load capacitance.
   a) Static b) Dynamic c) Noise d) None of the above

16) In Mealy circuit, the outputs depend only on
   a) Present state b) Present state, input
   c) Input d) None of the above

17) Sequential circuits often have external inputs that are asynchronous, input changes can cause temporary false values called _____ at the output and the next states.
   a) Glitch b) Clock skew
   c) Hazard d) None of the above

18) Most look up tables in FPGAs use _____ inputs, resulting in ____ possible outputs.
   a) 4, 16 b) 8, 16 c) 4, 12 d) 6, 12

19) Boundary scan is an IEEE _____ standard.
   a) 1149 b) 1164
   c) 1096 d) None of the above

20) Built in Self Test is used for
   a) Testing components b) Testing flip-flops
   c) Testing memory d) None of the above

_____

SLR-VB – 186

Seat No.	

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
VLSI DESIGN

Day and Date : Friday, 5-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

2. Solve **any four** : **16**
   a) Realize NOR gate using CMOS logic.
   b) Explain package with the help of syntax.
   c) Write the syntax for entity and architecture.
   d) Explain switching characteristics of CMOS inverter.
   e) Write a VHDL code for SR flip flop.

3. Solve the following : **24**
   a) Explain static and dynamic power dissipation. Derive and expression for total power dissipation.
   b) Write VHDL code for 4 bit up/down counter with synchronous and asynchronous reset.
   c) Explain various attributes in VHDL.

   OR

   c) Write a VHDL code for 4 bit adder using generate statement.

4. Solve **any four** : **16**
   a) Draw and explain Altera MAX 7000.
   b) Differentiate between CPLD and FPGA architectures.
   c) Write a VHDL code to detect a sequence 101.
   d) Explain Built-in-self-test with the help of neat diagram.
   e) Write down test bench for 1 : 4 demultiplexer.

5. Solve the following : **24**
   a) Draw and explain architecture of Altera flex 10K.
   b) Write a VHDL code for traffic light controller.
   c) Explain with the help of example testing of combinational logic.

   OR

   c) Explain boundary scan architecture with the help of diagram.

Set Q

SLR-VB – 186

Seat No.	

Set **R**

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
VLSI DESIGN

Day and Date : Friday, 5-5-2017 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) In Mealy circuit, the outputs depend only on
   a) Present state b) Present state, input
   c) Input d) None of the above

2) Sequential circuits often have external inputs that are asynchronous, input changes can cause temporary false values called _____ at the output and the next states.
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6) Slices are available in
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   a) Verify the functionality of a design b) To generate primitives
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P.T.O.

9) FLEX 10K contains
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10) Stuck at fault is generated when
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11) The ability to tolerate noise without affecting correct operation of the circuit is called
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15) In an entity, buffer is a
   a) Signal type b) Signal mode
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20) _____ power dissipation occurs due to charging and discharging of load capacitance.
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SLR-VB – 186

Seat No.	

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
VLSI DESIGN

Day and Date : Friday, 5-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

2. Solve **any four** : **16**
   a) Realize NOR gate using CMOS logic.
   b) Explain package with the help of syntax.
   c) Write the syntax for entity and architecture.
   d) Explain switching characteristics of CMOS inverter.
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   a) Explain static and dynamic power dissipation. Derive and expression for total power dissipation.
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   OR

   c) Write a VHDL code for 4 bit adder using generate statement.

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   a) Draw and explain Altera MAX 7000.
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   d) Explain Built-in-self-test with the help of neat diagram.
   e) Write down test bench for 1 : 4 demultiplexer.

5. Solve the following : **24**
   a) Draw and explain architecture of Altera flex 10K.
   b) Write a VHDL code for traffic light controller.
   c) Explain with the help of example testing of combinational logic.

   OR

   c) Explain boundary scan architecture with the help of diagram.

Set R

Set R

SLR-VB – 186

Seat No.	

Set **S**

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
VLSI DESIGN

Day and Date : Friday, 5-5-2017 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) _____ is a sequential statement.
   a) If-else b) Loop
   c) Case d) All of the above

2) A ripple counter is _____ sequential circuit
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3) Which of the following input combination is not allowed in SR flip-flop ?
   a) S = 0, R = 0 b) S = 0, R = 1 c) S = 1, R = 0 d) S = 1, R = 1

4) Flip-flop can store
   a) One bit of data b) Two bits of data
   c) Three bits of data d) All of the above

5) _____ power dissipation occurs due to charging and discharging of load capacitance.
   a) Static b) Dynamic c) Noise d) None of the above

6) In Mealy circuit, the outputs depend only on
   a) Present state b) Present state, input
   c) Input d) None of the above

7) Sequential circuits often have external inputs that are asynchronous, input changes can cause temporary false values called _____ at the output and the next states.
   a) Glitch b) Clock skew
   c) Hazard d) None of the above

8) Most look up tables in FPGAs use _____ inputs, resulting in ____ possible outputs.
   a) 4, 16 b) 8, 16 c) 4, 12 d) 6, 12

9) Boundary scan is an IEEE _____ standard.
   a) 1149 b) 1164 c) 1096 d) None of the above

P.T.O.

10) Built in Self Test is used for
   a) Testing components b) Testing flip-flops
   c) Testing memory d) None of the above

11) Slices are available in
   a) CPLD b) FPGA c) ASIC d) All of the above

12) A test bunch is used to
   a) Verify the functionality of a design b) To generate primitives
   c) To generate netlist d) None of the above

13) CPLD features a _____ type of memory.
   a) Volatile b) Non-volatile
   c) EPROM d) Volatile EPROM

14) FLEX 10K contains
   a) LABs b) EABs
   c) Both a) and b) d) None of the above

15) Stuck at fault is generated when
   a) An input to gate is incorrectly connected to power supply
   b) Input between gate is incorrectly connected
   c) Both a) and b)
   d) None of the above

16) The ability to tolerate noise without affecting correct operation of the circuit is called
   a) Dynamic power dissipation b) Noise margin
   c) Static power dissipation d) None of the above

17) Process in VHDL becomes active, when
   a) There is change in the value of signal in sensitivity list
   b) Change in clock statement
   c) Change in reset signal
   d) None of the above

18) The symbol _____ is the signal assignment operator.
   a) : = b) < = c) = > d) None of the above

19) In std_logic, high impedance is represented by
   a) 'Z' b) 'H' c) 'W' d) 'X'

20) In an entity, buffer is a
   a) Signal type b) Signal mode
   c) Signal port d) None of the above

_____

SLR-VB – 186

Seat No.	

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
VLSI DESIGN

Day and Date : Friday, 5-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

2. Solve **any four** : **16**
   a) Realize NOR gate using CMOS logic.
   b) Explain package with the help of syntax.
   c) Write the syntax for entity and architecture.
   d) Explain switching characteristics of CMOS inverter.
   e) Write a VHDL code for SR flip flop.

3. Solve the following : **24**
   a) Explain static and dynamic power dissipation. Derive and expression for total power dissipation.
   b) Write VHDL code for 4 bit up/down counter with synchronous and asynchronous reset.
   c) Explain various attributes in VHDL.

   OR

   c) Write a VHDL code for 4 bit adder using generate statement.

4. Solve **any four** : **16**
   a) Draw and explain Altera MAX 7000.
   b) Differentiate between CPLD and FPGA architectures.
   c) Write a VHDL code to detect a sequence 101.
   d) Explain Built-in-self-test with the help of neat diagram.
   e) Write down test bench for 1 : 4 demultiplexer.

5. Solve the following : **24**
   a) Draw and explain architecture of Altera flex 10K.
   b) Write a VHDL code for traffic light controller.
   c) Explain with the help of example testing of combinational logic.

   OR

   c) Explain boundary scan architecture with the help of diagram.

Set S

Set S

SLR-VB – 187

Seat No.	

Set **P**

B.E. (Electronics & Telecommunication) (Part – I) Examination, 2017
SATELLITE COMMUNICATION

Day and Date : Saturday, 6-5-2017 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) Perigee
   a) The point farthest from earth
   b) The point longest from earth
   c) The point closest approach to earth
   d) None of the above

2) What is the application of satellite systems ?
   a) Weather forecasting b) Terrestrial communication
   c) Point to point communication d) None of the above

3) Low-Earth-Orbit (LEO) satellites have _____ orbits.
   a) equatorial b) polar
   c) inclined d) none of the above

4) What are the types of antenna losses ?
   a) Sky noise b) Antenna losses
   c) Sky noise, Antenna losses d) All of these

5) The Atmospheric drag has negligible effect on
   a) Geostationary satellites b) MEO
   c) LEO d) None of these

6) The down link frequency in the C band transponder is
   a) 6 GHz b) 4 GHz c) 14 GHz d) 11 GHz

7) The frequencies for direct broadcast satellites vary from region to region throughout the world, although these are generally in the
   a) Ku band b) Ka band c) C-band d) None of these

8) Calculate the gain of a 3m parabolic antenna operating at a frequency of 12 GHz. Assume an aperture efficiency of 0.5.
   a) 48.9 dB b) 4.9 dB c) 48.9 dBHz d) None of above

P.T.O.

9) Write the equations of C/N ratio.
   a) C/N_0 = (EIRP) – LOSSES – (K) dBHz
   b) C/N_0 = (EIRP) + (G/T) – LOSSES – (K) dBHz
   c) C/N_0 = (EIRP) – LOSSES – (K) dB
   d) None of these

10) A satellite may carry ____ transponders.
   a) 24 b) 41 c) 32 d) None of these

11) MATV stands as
   a) Master Antenna TV (MATV) b) Maximum Angular TV
   c) Multi Amplitude TV d) None of these

12) The 24-MHz bandwidth of a transponder is capable of carrying
   a) Four analog television channels b) Two analog television channels
   c) One analog television channel d) None of these

13) Direct Broadcast Satellite (DBS) service is
   a) Planned broadcasting directly to home TV receivers
   b) With active attitude control, there is no overall stabilizing torque present to resist the disturbance
   c) With proper moment
   d) None of these

14) _____ is based on a principle called trilateration.
   a) Iridium b) Teledesic
   c) GPS d) None of the above

15) What is an noise power spectral density ?
   a) N_0 = PN/BN = KTN joules b) N_0 = BN/PN
   c) N_0 = BN/PN = KTNB0 joules d) None of above

16) A synchronous satellite orbits the earth once in
   a) 24 hours b) 12 hours c) 6 hours d) 1 hour

17) Satellite receives signal from
   a) Microwave repeater stations b) TV relay station
   c) Appropriate earth station d) All of the above

18) Mention the perigee height
   a) $r_p = a (1 + e)$, $Hp = R - r_p$ b) $r_p = a (1 + e)$, $Ha = R - r_a$
   c) $r_p = a (1 + e)$, $Ha = r_p - R$ d) None of above

19) Iridium satellites are _____ satellites.
   a) GEO b) MEO c) LEO d) None of above

20) What is burst code word ?
   a) it is a binary word, a copy of which is stored at each earth station
   b) it is a digital word, a copy of which is stored at each earth station
   c) a and b
   d) none of these

Set P

_____

SLR-VB – 187

Seat No.	

B.E. (Electronics & Telecommunication) (Part – I) Examination, 2017
SATELLITE COMMUNICATION

Day and Date : Saturday, 6-5-2017 Marks : 80

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

SECTION – I

2. Solve **any four** : **(4×4=16)**

   1) What do you mean by Geostationary satellite.

   2) Write a short note on development of satellite communication.

   3) Discuss in brief the orbits of a satellite.

   4) Explain equipment reliability and space qualification.

   5) Describe uplink design.

3. Solve **any three** : **(3×8=24)**

   1) Explain orbital perturbations, Launchers and launch vehicles.

   2) An earth station situated in the Docklands of London, England needs to calculate the look angles to a geostationary satellite in the Indian ocean by Intelsat. The details of the earth station site are Earth station latitude and longitude are 52.0° and 0°, Satellite longitude is 66.0°E. Find the central angle, elevation angle, Intermediate angle and Azimuth angle.

   3) Derive the expression for system noise temperature and G/T ratio.

   4) What are the different subsystems used in satellite ?

SECTION – II

4. Solve **any four** : **(4×4=16)**

   1) Explain earth station Testing.

   2) Write a note on Sun – synchronous orbit and Molniya orbits.

   3) Give a short note on satellite radio broadcasting.

   4) Describe the concept of GPS time.

   5) Discuss orbit consideration in detail.

5. Solve **any three** : **(3×8=24)**

   1) Explain with block diagram C/A code generator and GPS receiver.

   2) Write short notes on equatorial orbits, inclined orbits and elliptical orbits.

   3) Brief the earth station design consideration.

   4) Explain Coverage and frequency consideration.

SLR-VB – 187

Seat No.	

Set Q

B.E. (Electronics & Telecommunication) (Part – I) Examination, 2017
SATELLITE COMMUNICATION

Day and Date : Saturday, 6-5-2017 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) A synchronous satellite orbits the earth once in
   a) 24 hours b) 12 hours c) 6 hours d) 1 hour

2) Satellite receives signal from
   a) Microwave repeater stations b) TV relay station
   c) Appropriate earth station d) All of the above

3) Mention the perigee height
   a) $r_p = a(1 + e)$, $Hp = R - r_p$ b) $r_p = a(1 + e)$, $Ha = R - r_a$
   c) $r_p = a(1 + e)$, $Ha = r_p - R$ d) None of above

4) Iridium satellites are _____ satellites.
   a) GEO b) MEO c) LEO d) None of above

5) What is burst code word ?
   a) it is a binary word, a copy of which is stored at each earth station
   b) it is a digital word, a copy of which is stored at each earth station
   c) a and b
   d) None of these

6) Perigee
   a) The point farthest from earth
   b) The point longest from earth
   c) The point closest approach to earth
   d) None of the above

7) What is the application of satellite systems ?
   a) Weather forecasting b) Terrestrial communication
   c) Point to point communication d) None of the above

P.T.O.

8) Low-Earth-Orbit (LEO) satellites have _____ orbits.
   a) equatorial b) polar
   c) inclined d) none of the above

9) What are the types of antenna losses ?
   a) Sky noise b) Antenna losses
   c) Sky noise, Antenna losses d) All of these

10) Atmospheric drag has negligible effect on
   a) Geostationary satellites b) MEO
   c) LEO d) None of these

11) The down link frequency in the C band transponder is
   a) 6 GHz b) 4 GHz c) 14 GHz d) 11 GHz

12) The frequencies for direct broadcast satellites vary from region to region throughout the world, although these are generally in the
   a) Ku band b) Ka band c) C-band d) None of these

13) Calculate the gain of a 3m parabolic antenna operating at a frequency of 12 GHz. Assume an aperture efficiency of 0.5.
   a) 48.9 dB b) 4.9 dB c) 48.9 dBHz d) None of above

14) Write the equations of C/N ratio.
   a) C/N_0 = (EIRP) – LOSSES – (K) dBHz
   b) C/N_0 = (EIRP) + (G/T) – LOSSES – (K) dBHz
   c) C/N_0 = (EIRP) – LOSSES – (K) dB
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15) A satellite may carry ____ transponders.
   a) 24 b) 41 c) 32 d) None of these

16) MATV stands as
   a) Master Antenna TV (MATV) b) Maximum Angular TV
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17) The 24-MHz bandwidth of a transponder is capable of carrying
   a) Four analog television channels b) Two analog television channels
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18) Direct Broadcast Satellite (DBS) service is
   a) Planned broadcasting directly to home TV receivers
   b) With active attitude control, there is no overall stabilizing torque present to resist the disturbance
   c) With proper moment
   d) None of these

19) _____ is based on a principle called trilateration.
   a) Iridium b) Teledesic
   c) GPS d) None of the above

20) What is an noise power spectral density ?
   a) N_0 = PN/BN = KTN joules b) N_0 = BN/PN
   c) N_0 = BN/PN = KTNB0 joules d) None of above

Set Q

_____

SLR-VB – 187

Seat No.	

B.E. (Electronics & Telecommunication) (Part – I) Examination, 2017
SATELLITE COMMUNICATION

Day and Date : Saturday, 6-5-2017 Marks : 80

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

SECTION – I

2. Solve **any four** : **(4×4=16)**

   1) What do you mean by Geostationary satellite.

   2) Write a short note on development of satellite communication.

   3) Discuss in brief the orbits of a satellite.

   4) Explain equipment reliability and space qualification.

   5) Describe uplink design.

3. Solve **any three** : **(3×8=24)**

   1) Explain orbital perturbations, Launchers and launch vehicles.

   2) An earth station situated in the Docklands of London, England needs to calculate the look angles to a geostationary satellite in the Indian ocean by Intelsat. The details of the earth station site are Earth station latitude and longitude are 52.0° and 0°, Satellite longitude is 66.0°E. Find the central angle, elevation angle, Intermediate angle and Azimuth angle.

   3) Derive the expression for system noise temperature and G/T ratio.

   4) What are the different subsystems used in satellite ?

SECTION – II

4. Solve **any four** : **(4×4=16)**

   1) Explain earth station Testing.

   2) Write a note on Sun – synchronous orbit and Molniya orbits.

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   4) Describe the concept of GPS time.

   5) Discuss orbit consideration in detail.

5. Solve **any three** : **(3×8=24)**

   1) Explain with block diagram C/A code generator and GPS receiver.

   2) Write short notes on equatorial orbits, inclined orbits and elliptical orbits.

   3) Brief the earth station design consideration.

   4) Explain Coverage and frequency consideration.

SLR-VB – 187

Seat No.	

Set R

B.E. (Electronics & Telecommunication) (Part – I) Examination, 2017
SATELLITE COMMUNICATION

Day and Date : Saturday, 6-5-2017 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) MATV stands as
   a) Master Antenna TV (MATV) b) Maximum Angular TV
   c) Multi Amplitude TV d) None of these

2) The 24-MHz bandwidth of a transponder is capable of carrying
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3) Direct Broadcast Satellite (DBS) service is
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4) _____ is based on a principle called trilateration.
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5) What is an noise power spectral density ?
   a) N_0 = PN/BN = KTN joules b) N_0 = BN/PN
   c) N_0 = BN/PN = KTNB0 joules d) None of above

6) A synchronous satellite orbits the earth once in
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8) Mention the perigee height
   a) $r_p = a (1 + e)$, $Hp = R - r_p$ b) $r_p = a (1 + e)$, $Ha = R - r_a$
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P.T.O.

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12) What is the application of satellite systems ?
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13) Low-Earth-Orbit (LEO) satellites have _____ orbits.
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20) A satellite may carry ____ transponders.
a) 24 b) 41 c) 32 d) None of these

_____

SLR-VB – 187

Seat No.	

B.E. (Electronics & Telecommunication) (Part – I) Examination, 2017
SATELLITE COMMUNICATION

Day and Date : Saturday, 6-5-2017 Max. Marks : 80

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

SECTION – I

2. Solve **any four** : **(4×4=16)**

   1) What do you mean by Geostationary satellite.

   2) Write a short note on development of satellite communication.

   3) Discuss in brief the orbits of a satellite.

   4) Explain equipment reliability and space qualification.

   5) Describe uplink design.

3. Solve **any three** : **(3×8=24)**

   1) Explain orbital perturbations, Launchers and launch vehicles.

   2) An earth station situated in the Docklands of London, England needs to calculate the look angles to a geostationary satellite in the Indian ocean by Intelsat. The details of the earth station site are Earth station latitude and longitude are 52.0° and 0°, Satellite longitude is 66.0°E. Find the central angle, elevation angle, Intermediate angle and Azimuth angle.

   3) Derive the expression for system noise temperature and G/T ratio.

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SECTION – II

4. Solve **any four** : **(4×4=16)**

   1) Explain earth station Testing.

   2) Write a note on Sun – synchronous orbit and Molniya orbits.

   3) Give a short note on satellite radio broadcasting.

   4) Describe the concept of GPS time.

   5) Discuss orbit consideration in detail.

5. Solve **any three** : **(3×8=24)**

   1) Explain with block diagram C/A code generator and GPS receiver.

   2) Write short notes on equatorial orbits, inclined orbits and elliptical orbits.

   3) Brief the earth station design consideration.

   4) Explain Coverage and frequency consideration.

SLR-VB – 187

Seat No.	

Set S

B.E. (Electronics & Telecommunication) (Part – I) Examination, 2017
SATELLITE COMMUNICATION

Day and Date : Saturday, 6-5-2017 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) The down link frequency in the C band transponder is
a) 6 GHz b) 4 GHz c) 14 GHz d) 11 GHz

2) The frequencies for direct broadcast satellites vary from region to region throughout the world, although these are generally in the
a) Ku band b) Ka band c) C-band d) None of these

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5) A satellite may carry ____ transponders.
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7) The 24-MHz bandwidth of a transponder is capable of carrying
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P.T.O.

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   a) it is a binary word, a copy of which is stored at each earth station
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   a) Sky noise b) Antenna losses
   c) Sky noise, Antenna losses d) All of these

20) Atmospheric drag has negligible effect on
   a) Geostationary satellites b) MEO
   c) LEO d) None of these

_____

SLR-VB – 187

Seat No.	

B.E. (Electronics & Telecommunication) (Part – I) Examination, 2017
SATELLITE COMMUNICATION

Day and Date : Saturday, 6-5-2017 Marks : 80

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

SECTION – I

2. Solve **any four** : **(4×4=16)**

   1) What do you mean by Geostationary satellite.

   2) Write a short note on development of satellite communication.

   3) Discuss in brief the orbits of a satellite.

   4) Explain equipment reliability and space qualification.

   5) Describe uplink design.

3. Solve **any three** : **(3×8=24)**

   1) Explain orbital perturbations, Launchers and launch vehicles.

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   3) Derive the expression for system noise temperature and G/T ratio.

   4) What are the different subsystems used in satellite ?

SECTION – II

4. Solve **any four** : **(4×4=16)**

   1) Explain earth station Testing.

   2) Write a note on Sun – synchronous orbit and Molniya orbits.

   3) Give a short note on satellite radio broadcasting.

   4) Describe the concept of GPS time.

   5) Discuss orbit consideration in detail.

5. Solve **any three** : **(3×8=24)**

   1) Explain with block diagram C/A code generator and GPS receiver.

   2) Write short notes on equatorial orbits, inclined orbits and elliptical orbits.

   3) Brief the earth station design consideration.

   4) Explain Coverage and frequency consideration.

SLR-VB – 188

Seat No.	

Set **P**

B.E. (E&TC) (Part – I) Examination, 2017
CODING THEORY

Day and Date : Monday, 8-5-2017 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) Figures to the **right** indicate **full** marks.*
*4) **All** questions are **compulsory**.*
*5) Assume suitable data **if necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) A random variable that takes on a finite number of values is known as a
   A) Continuous random variable B) Discrete random variable
   C) Both A or B D) None of these

2) Each letter of the word ATTRACT is written on a separate card. The cards are then thoroughly shuffled, and four of them are drawn in succession. What is the probability of getting a result 'TACT' ?
   A) 1/7 B) 1/35 C) 1/70 D) 1/105

3) A parity check code can
   A) Detect a single bit error B) Correct a single bit error
   C) Detect two bit error D) Correct two bit error

4) The redundancy of (n, k) code is defined as
   A) n/k B) k/n C) n-k/n D) n-k/k

5) Cyclic code is a subclass of
   A) Convolution code B) Turbo code C) Block code D) None of these

6) In convolution code encoder with a six stage shift register, the number of modulo-2 adders is 4. For an input data stream of 5 bits, the code word size will be
   A) 120 B) 54 C) 50 D) 44

7) The sequential decoding method is _____ times faster than the exhaustive method for k = 4.
   A) 128 B) 25 C) 21 D) 12

8) Two types of interleavers are commonly used
   A) block interleavers, cyclic interleavers
   B) block interleavers, turbo interleavers
   C) block interleavers, convolution interleavers
   D) none of these

P.T.O.

9) The total area under the probability distribution curve is
   A) 1 B) 0
   C) Depends on the nature of distribution D) None of the above

10) In terms of the state diagram for any rate code catastrophic errors can occur if, and only if, any closed loop path in the diagram has _____ weight.
   A) 0 B) 1 C) 3 D) INFINITE

11) As most of the natural phenomenon are characterized by random variables with _____
   A) Poisson distribution B) Binomial distribution
   C) Normal distribution D) All of these

12) Arithmetic average and statistical average are _____
   A) same B) different
   C) for special case they are same D) none of these

13) For each $(k \times n)$ generator matrix G, there exists an _____ matrix H.
   A) $(n - k) \times k$ B) $k \times n$ C) $k \times (n - k)$ D) $(n - k) \times n$

14) Event A and B are statistically independent if
   A) A and B occur simultaneousy
   B) A and B occur at different times
   C) Occurrence of A includes occurrence of B
   D) None of these

15) The weight of code 1101101 is
   A) 6 B) 5 C) 4 D) 3

16) The stationary process has
   A) Ensemble average equal to time average
   B) All the statistical properties dependent on time
   C) All the statistical properties independent on time
   D) Zero variance

17) Which of the following cannot be a member of the matrix P ?
   A) 011 B) 101 C) 010 D) 111

18) The practicability of the cyclic decoder depends on the complexity of the combinational logic circuit in the _____
   A) error detector B) shift register
   C) comparator D) modulo two operator

19) The starting point on the code tree is at the _____ and corresponds to the situation before the arrival of the first message bit.
   A) extreme right B) extreme left C) middle D) none of these

20) For double error correction the minimum distance required is
   A) 5 B) 4 C) 3 D) 2

_____

SLR-VB – 188

Seat No.	

B.E. (E&TC) (Part – I) Examination, 2017
CODING THEORY

Day and Date : Monday, 8-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. A) Attempt **any three** : **12**

a) Explain in brief statistical average and time average.

b) State and prove Baye's theorem.

c) How error detection and correction is done in linear block code ? Explain it with suitable example.

d) What is standard array ? How it is useful in decoding linear block codes ?

B) The generator polynomial for a (15, 7) cyclic code is $g(x) = 1 + x^4 + x^6 + x^7 + x^8$. **8**

i) Find the code vector in nonsystematic form for the message polynomial $D(x) = X + X^2 + X^3 + X^4$.

ii) Find the code vector in systematic form for the message polynomial $D(x) = 1 + x + x^2 + x^4$.

3. A) Attempt **any two** : **8**

a) The parity check matrix for (7, 4) block code is given by

$$H = \begin{bmatrix} 1011100 \\ 1101010 \\ 1110001 \end{bmatrix}$$

Draw the decoder :

b) The generator polynomial of (6, 3) cyclic code $g(x) = 1 + x^2$. Find all codewords using non systematic method.

c) Define :

i) Vector space

ii) Vector subspace.

B) a) The joint probability function of two random variables X and Y is given by **8**

$f(x, y) = c(x^2 + 2y)$ $x = 0, 1, 2,$ $y = 1, 2, 3, 4$

$=0$ otherwise

Find :

i) Value of C ii) $P(X = 2, Y = 3)$ iii) $P(X \leq 1, Y>2)$.

b) Define : **4**

i) Random processes ii) Ergodic processes.

SECTION – II

4. A) Attempt **any three** : **12**

a) What is maximum likelihood algorithm ? How it is used in viterbi decoding ?

b) In a factory 4 machine A1, A2, A3 & A4 produce 10%, 20%, 30% & 40% of the items respectively. The % of defective items produced by them is 5%, 4%, 3%, 2% respectively. An item selected at random is found to be defective, what is the probability that it was produced by machine A2 ?

c) Define :

i) coding gain ii) catastrophic error propagation

d) Explain in brief turbo encoder.

B) For given convolutional encoder (Fig. 1) construct code tree and find the output sequence for message 11101. **8**

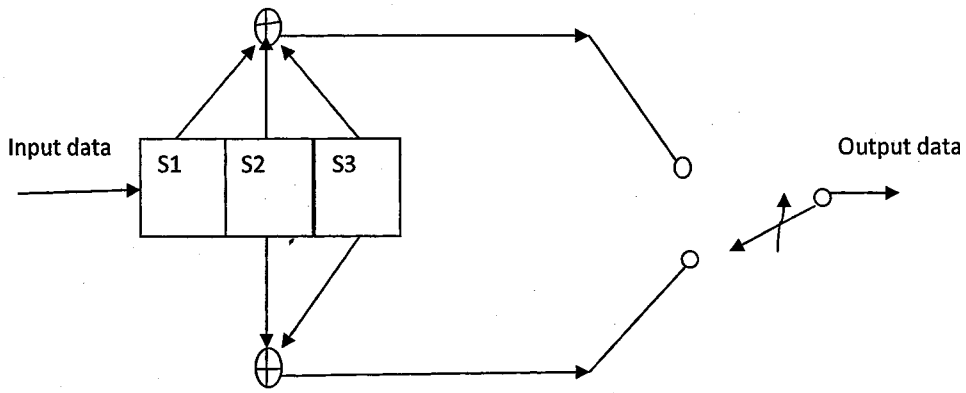

Fig 1

5. A) Attempt **any two** : **10**

a) Explain add compare select computation used in decoder implementation of convolutional codes.

b) Draw trellis diagram for convolution coder given in Fig. 1 for input data 11011.

c) With example explain polynomial representation technique of convolution coding.

B) a) Explain the method of Viterbi convolution decoding algorithm with suitable example. **5**

b) Explain different types of interleavers. **5**

Set P

SLR-VB – 188

Seat No.	

Set Q

B.E. (E&TC) (Part – I) Examination, 2017
CODING THEORY

Day and Date : Monday, 8-5-2017 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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*4) **All** questions are **compulsory**.*
*5) Assume suitable data **if necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) The stationary process has
   A) Ensemble average equal to time average
   B) All the statistical properties dependent on time
   C) All the statistical properties independent on time
   D) Zero variance

2) Which of the following cannot be a member of the matrix P ?
   A) 011 B) 101 C) 010 D) 111

3) The practicability of the cyclic decoder depends on the complexity of the combinational logic circuit in the _____
   A) error detector B) shift register
   C) comparator D) modulo two operator

4) The starting point on the code tree is at the _____ and corresponds to the situation before the arrival of the first message bit.
   A) extreme right B) extreme left C) middle D) none of these

5) For double error correction the minimum distance required is
   A) 5 B) 4 C) 3 D) 2

6) A random variable that takes on a finite number of values is known as a
   A) Continuous random variable B) Discrete random variable
   C) Both A or B D) None of these

7) Each letter of the word ATTRACT is written on a separate card. The cards are then thoroughly shuffled, and four of them are drawn in succession. What is the probability of getting a result 'TACT' ?
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   A) Detect a single bit error B) Correct a single bit error
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P.T.O.

9) The redundancy of (n, k) code is defined as
A) n/k B) k/n C) n-k/n D) n-k/k

10) Cyclic code is a subclass of
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11) In convolution code encoder with a six stage shift register, the number of modulo-2 adders is 4. For an input data stream of 5 bits, the code word size will be
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A) 128 B) 25 C) 21 D) 12

13) Two types of interleavers are commonly used
A) block interleavers, cyclic interleavers
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14) The total area under the probability distribution curve is
A) 1 B) 0
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15) In terms of the state diagram for any rate code catastrophic errors can occur if, and only if, any closed loop path in the diagram has _____ weight.
A) 0 B) 1 C) 3 D) INFINITE

16) As most of the natural phenomenon are characterized by random variables with _____
A) Poisson distribution B) Binomial distribution
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17) Arithmetic average and statistical average are _____
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18) For each ($k \times n$) generator matrix G, there exists an _____ matrix H.
A) $(n - k) \times k$ B) $k \times n$ C) $k \times (n - k)$ D) $(n - k) \times n$

19) Event A and B are statistically independent if
A) A and B occur simultaneousy
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20) The weight of code 1101101 is
A) 6 B) 5 C) 4 D) 3

_____

SLR-VB – 188

Seat No.	

B.E. (E&TC) (Part – I) Examination, 2017
CODING THEORY

Day and Date : Monday, 8-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1) Figures to the **right** indicate **full** marks.*
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*3) Assume suitable data **if necessary**.*

SECTION – I

2. A) Attempt **any three** : **12**

a) Explain in brief statistical average and time average.

b) State and prove Baye's theorem.

c) How error detection and correction is done in linear block code ? Explain it with suitable example.

d) What is standard array ? How it is useful in decoding linear block codes ?

B) The generator polynomial for a (15, 7) cyclic code is $g(x) = 1 + x^4 + x^6 + x^7 + x^8$. **8**

i) Find the code vector in nonsystematic form for the message polynomial $D(x) = X + X^2 + X^3 + X^4$.

ii) Find the code vector in systematic form for the message polynomial $D(x) = 1 + x + x^2 + x^4$.

3. A) Attempt **any two** : **8**

a) The parity check matrix for (7, 4) block code is given by

$$H = \begin{bmatrix} 1011100 \\ 1101010 \\ 1110001 \end{bmatrix}$$

Draw the decoder :

b) The generator polynomial of (6, 3) cyclic code $g(x) = 1 + x^2$. Find all codewords using non systematic method.

c) Define :

i) Vector space

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B) a) The joint probability function of two random variables X and Y is given by **8**

$f(x, y) = c(x^2 + 2y)$ $x = 0, 1, 2,$ $y = 1, 2, 3, 4$

$=0$ otherwise

Find :

i) Value of C ii) $P(X = 2, Y = 3)$ iii) $P(X \leq 1, Y>2)$.

b) Define : **4**

i) Random processes ii) Ergodic processes.

SECTION – II

4. A) Attempt **any three** : **12**

a) What is maximum likelihood algorithm ? How it is used in viterbi decoding ?

b) In a factory 4 machine A1, A2, A3 & A4 produce 10%, 20%, 30% & 40% of the items respectively. The % of defective items produced by them is 5%, 4%, 3%, 2% respectively. An item selected at random is found to be defective, what is the probability that it was produced by machine A2 ?

c) Define :

i) coding gain ii) catastrophic error propagation

d) Explain in brief turbo encoder.

B) For given convolutional encoder (Fig. 1) construct code tree and find the output sequence for message 11101. **8**

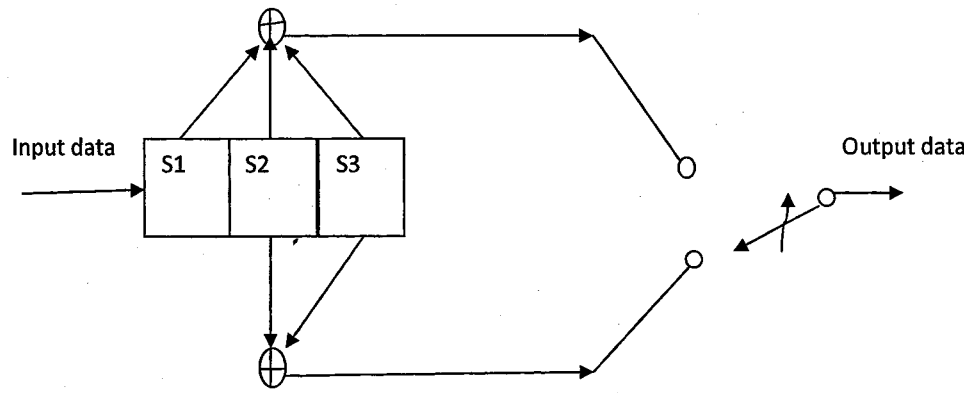

Fig 1

5. A) Attempt **any two** : **10**

a) Explain add compare select computation used in decoder implementation of convolutional codes.

b) Draw trellis diagram for convolution coder given in Fig. 1 for input data 11011.

c) With example explain polynomial representation technique of convolution coding.

B) a) Explain the method of Viterbi convolution decoding algorithm with suitable example. **5**

b) Explain different types of interleavers. **5**

Set Q

SLR-VB – 188

Seat No.	

Set **R**

B.E. (E&TC) (Part – I) Examination, 2017
CODING THEORY

Day and Date : Monday, 8-5-2017 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. Choose the correct answer : **(20×1=20)**

1) As most of the natural phenomenon are characterized by random variables with _____
   A) Poisson distribution B) Binomial distribution
   C) Normal distribution D) All of these

2) Arithmetic average and statistical average are _____
   A) same B) different
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3) For each $(k \times n)$ generator matrix G, there exists an _____ matrix H.
   A) $(n - k) \times k$ B) $k \times n$ C) $k \times (n - k)$ D) $(n - k) \times n$

4) Event A and B are statistically independent if
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5) The weight of code 1101101 is
   A) 6 B) 5 C) 4 D) 3

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P.T.O.

9) The starting point on the code tree is at the _____ and corresponds to the situation before the arrival of the first message bit.
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17) The sequential decoding method is _____ times faster than the exhaustive method for k = 4.
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20) In terms of the state diagram for any rate code catastrophic errors can occur if, and only if, any closed loop path in the diagram has _____ weight.
A) 0 B) 1 C) 3 D) INFINITE

_____

SLR-VB – 188

Seat No.	

B.E. (E&TC) (Part – I) Examination, 2017
CODING THEORY

Day and Date : Monday, 8-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1) Figures to the **right** indicate **full** marks.*
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SECTION – I

2. A) Attempt **any three** : **12**

a) Explain in brief statistical average and time average.

b) State and prove Baye's theorem.

c) How error detection and correction is done in linear block code ? Explain it with suitable example.

d) What is standard array ? How it is useful in decoding linear block codes ?

B) The generator polynomial for a (15, 7) cyclic code is $g(x) = 1 + x^4 + x^6 + x^7 + x^8$. **8**

i) Find the code vector in nonsystematic form for the message polynomial $D(x) = X + X^2 + X^3 + X^4$.

ii) Find the code vector in systematic form for the message polynomial $D(x) = 1 + x + x^2 + x^4$.

3. A) Attempt **any two** : **8**

a) The parity check matrix for (7, 4) block code is given by

$$H = \begin{bmatrix} 1011100 \\ 1101010 \\ 1110001 \end{bmatrix}$$

Draw the decoder :

b) The generator polynomial of (6, 3) cyclic code $g(x) = 1 + x^2$. Find all codewords using non systematic method.

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$f(x, y) = c(x^2 + 2y)$ $x = 0, 1, 2,$ $y = 1, 2, 3, 4$

$=0$ otherwise

Find :

i) Value of C ii) $P(X = 2, Y = 3)$ iii) $P(X \leq 1, Y>2)$.

b) Define : **4**

i) Random processes ii) Ergodic processes.

SECTION – II

4. A) Attempt **any three** : **12**

a) What is maximum likelihood algorithm ? How it is used in viterbi decoding ?

b) In a factory 4 machine A1, A2, A3 & A4 produce 10%, 20%, 30% & 40% of the items respectively. The % of defective items produced by them is 5%, 4%, 3%, 2% respectively. An item selected at random is found to be defective, what is the probability that it was produced by machine A2 ?

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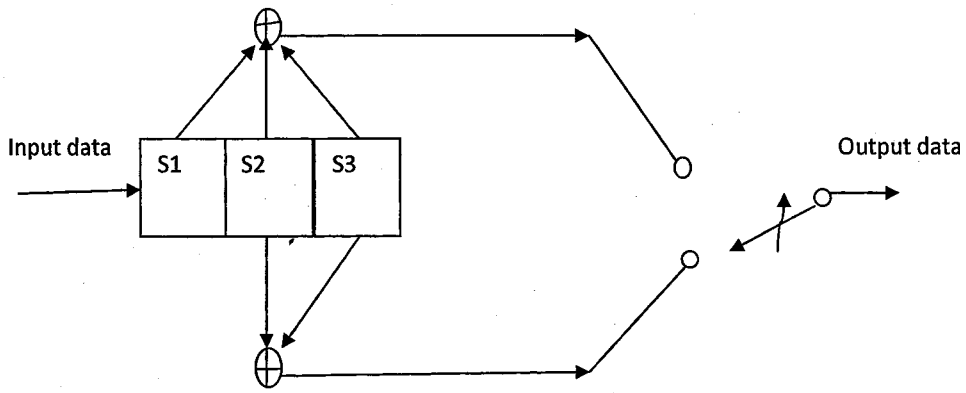

Fig 1

5. A) Attempt **any two** : **10**

a) Explain add compare select computation used in decoder implementation of convolutional codes.

b) Draw trellis diagram for convolution coder given in Fig. 1 for input data 11011.

c) With example explain polynomial representation technique of convolution coding.

B) a) Explain the method of Viterbi convolution decoding algorithm with suitable example. **5**

b) Explain different types of interleavers. **5**

Set R

SLR-VB – 188

Seat No.	

Set **S**

B.E. (E&TC) (Part – I) Examination, 2017
CODING THEORY

Day and Date : Monday, 8-5-2017 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. Choose the correct answer : **(20×1=20)**

1) In convolution code encoder with a six stage shift register, the number of modulo-2 adders is 4. For an input data stream of 5 bits, the code word size will be
A) 120 B) 54 C) 50 D) 44

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A) 128 B) 25 C) 21 D) 12

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_____

SLR-VB – 188

Seat No.	

B.E. (E&TC) (Part – I) Examination, 2017
CODING THEORY

Day and Date : Monday, 8-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1) Figures to the **right** indicate **full** marks.*
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SECTION – I

2. A) Attempt **any three** : **12**

a) Explain in brief statistical average and time average.

b) State and prove Baye's theorem.

c) How error detection and correction is done in linear block code ? Explain it with suitable example.

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$=0$ otherwise

Find :

i) Value of C ii) $P(X = 2, Y = 3)$ iii) $P(X \leq 1, Y>2)$.

b) Define : **4**

i) Random processes ii) Ergodic processes.

SECTION – II

4. A) Attempt **any three** : **12**

a) What is maximum likelihood algorithm ? How it is used in viterbi decoding ?

b) In a factory 4 machine A1, A2, A3 & A4 produce 10%, 20%, 30% & 40% of the items respectively. The % of defective items produced by them is 5%, 4%, 3%, 2% respectively. An item selected at random is found to be defective, what is the probability that it was produced by machine A2 ?

c) Define :

i) coding gain ii) catastrophic error propagation

d) Explain in brief turbo encoder.

B) For given convolutional encoder (Fig. 1) construct code tree and find the output sequence for message 11101. **8**

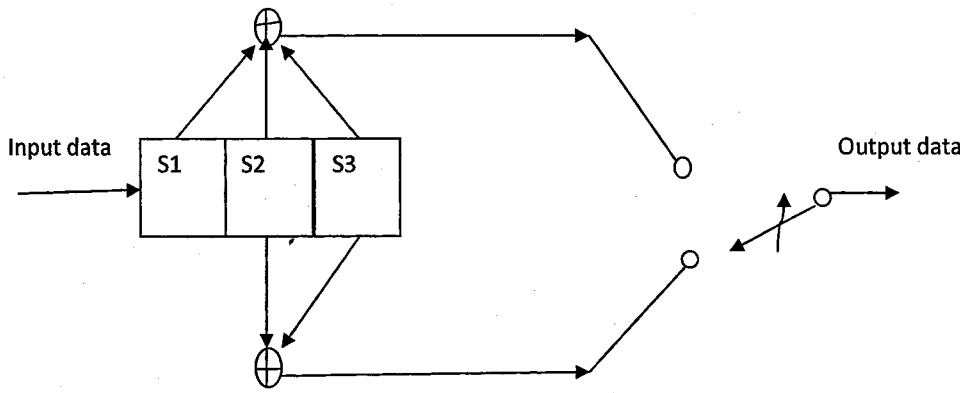

Fig 1

5. A) Attempt **any two** : **10**

a) Explain add compare select computation used in decoder implementation of convolutional codes.

b) Draw trellis diagram for convolution coder given in Fig. 1 for input data 11011.

c) With example explain polynomial representation technique of convolution coding.

B) a) Explain the method of Viterbi convolution decoding algorithm with suitable example. **5**

b) Explain different types of interleavers. **5**

Set S

SLR-VB – 189

Seat No.	

Set **P**

B.E. (Part – I) (Electronics & Telecommunication Engineering) Examination, 2017
Elective – I : ADVANCED TELECOMMUNICATION NETWORK

Day and Date : Tuesday, 9-5-2017 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) WLAN corresponds to
   a) IEEE 802.11 b) IEEE 802.15
   c) IEEE 802.16 d) None of the above

2) WPAN stands for
   a) Wireless Personal Area Network b) Wired Personal Area Network
   c) Wireless Personal Access Network d) None of the above

3) TDMA scheme is used in
   a) 802.15.1 b) 802.15.4
   c) Both (a) and (b) 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) SDH stands for
   a) Synchronous Digital Hierarchy b) Synchronous Data Hierarchy
   c) Synchronous Discrete Hierarchy d) None of the above

6) _____ is the expected data rate for 4G.
   a) 100 Mbps b) 100 Kbps c) 10 Mbps d) 200 Kbps

7) PSTN stands for
   a) Public Switched Telecommunication Networks
   b) Public Server Telecommunication Networks
   c) Phone Switched Telecommunication Networks
   d) Phone Server Telecommunication Networks

8) LTE encompasses
   a) Broadband wireless
   b) Convergence of technology and networks
   c) Technology shift to all IP and embedded security
   d) All of the above

P.T.O.

9) SONET was originally designed for
   a) Public telephone network b) TV system
   c) Wireless communication d) None of the above

10) _____ is a standard developed by ITU-T.
   a) SONET b) SDH c) Either (a) or (b) d) Neither (a) or (b)

11) _____ is to determine spectrum availability and presence of licensed users.
   a) Spectrum sensing b) Spectrum sharing
   c) Spectrum mobility d) None of the above

12) _____ is to distribute spectrum holes fairly among 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 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 sensing b) Spectrum sharing
   c) Spectrum mobility d) All of the above

15) In _____ relaying, if signal to noise ratio of signal received at the relay exceeds a certain threshold, relay performs decode and forward operation on the message.
   a) Fixed b) Adaptive
   c) Both (a) and (b) d) None of the above

16) MIMO stands for
   a) Multiple Input Multiple Output b) Memory In Memory Out
   c) Multiple Instructions Multiple Output d) None of the above

17) CR stands for
   a) Cognitive Radio b) Cognizent Radio
   c) Correlative Radio d) None of the above

18) _____ can be used for tele-healthcare.
   a) Cognitive radio b) Cooperative communications
   c) Both (a) and (b) d) None of the above

19) In _____ communication, independent paths between user and base station are generated via introduction of relay channel.
   a) Cooperative b) Correlative
   c) Congestive 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-VB – 189

Seat No.	

B.E. (Part – I) (Electronics & Telecommunication Engineering) Examination, 2017
Elective – I : ADVANCED TELECOMMUNICATION NETWORK

Day and Date : Tuesday, 9-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

2. Solve **any four** : **20**

   a) Explain how RFID tag and reader communication with each other.

   b) Explain the various operating modes supported by Bluethooth.

   c) Explain the concept of IP multimedia subsystem for NGN.

   d) Write a note on wimax advanced.

   e) Explain Metro optical networking.

3. Solve the following : **20**

   a) What do you mean by WMAN ? Explain its typical features and enumerate important physical layer parameters of IEEE 802.15.

   b) Explain various types of optical network topologies.

   c) Explain transition of IP network to NGN.

4. Solve **any four** : **20**

   a) Explain the conceptual structure of cooperative communication.

   b) List out the design considerations in cognitive radio.

   c) Draw the architecture of cognitive radio network.

   d) What are the special requirements of telehealthcare ?

   e) Discuss the applications of coopertaive communication.

5. Solve the following : **20**

   a) Discuss cognitive cycle with spectrum sensing, spectrum sharing, spectrum mobility and spectrum management.

   b) Discuss various implementation scenarios and issues related to cooperative communication.

   c) Explain how cooperative communication is used for telehealthcare.

Set P

Set P

SLR-VB – 189

Seat No.	

Set **Q**

B.E. (Part – I) (Electronics & Telecommunication Engineering) Examination, 2017
Elective – I : ADVANCED TELECOMMUNICATION NETWORK

Day and Date : Tuesday, 9-5-2017 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**

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   d) None of the above

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P.T.O.

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   b) Convergence of technology and networks
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_____

SLR-VB – 189

Seat No.	

B.E. (Part – I) (Electronics & Telecommunication Engineering) Examination, 2017
Elective – I : ADVANCED TELECOMMUNICATION NETWORK

Day and Date : Tuesday, 9-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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   d) Write a note on wimax advanced.

   e) Explain Metro optical networking.

3. Solve the following : **20**

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   b) List out the design considerations in cognitive radio.

   c) Draw the architecture of cognitive radio network.

   d) What are the special requirements of telehealthcare ?

   e) Discuss the applications of coopertaive communication.

5. Solve the following : **20**

   a) Discuss cognitive cycle with spectrum sensing, spectrum sharing, spectrum mobility and spectrum management.

   b) Discuss various implementation scenarios and issues related to cooperative communication.

   c) Explain how cooperative communication is used for telehealthcare.

Set Q

Set Q

SLR-VB – 189

Seat No.	

Set **R**

B.E. (Part – I) (Electronics & Telecommunication Engineering) Examination, 2017
Elective – I : ADVANCED TELECOMMUNICATION NETWORK

Day and Date : Tuesday, 9-5-2017 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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P.T.O.

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_____

SLR-VB – 189

Seat No.	

B.E. (Part – I) (Electronics & Telecommunication Engineering) Examination, 2017
Elective – I : ADVANCED TELECOMMUNICATION NETWORK

Day and Date : Tuesday, 9-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

2. Solve **any four** : **20**
   a) Explain how RFID tag and reader communication with each other.
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4. Solve **any four** : **20**
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   d) What are the special requirements of telehealthcare ?
   e) Discuss the applications of coopertaive communication.

5. Solve the following : **20**
   a) Discuss cognitive cycle with spectrum sensing, spectrum sharing, spectrum mobility and spectrum management.
   b) Discuss various implementation scenarios and issues related to cooperative communication.
   c) Explain how cooperative communication is used for telehealthcare.

Set R

SLR-VB – 189

Seat No.	

Set **S**

B.E. (Part – I) (Electronics & Telecommunication Engineering) Examination, 2017
Elective – I : ADVANCED TELECOMMUNICATION NETWORK

Day and Date : Tuesday, 9-5-2017 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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P.T.O.

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   b) Adaptive
   c) Both (a) and (b)
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19) Bluetooth operates over _____ frequency band.
   a) 2.4 GHz
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   a) Synchronous Digital Hierarchy
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   d) None of the above

_____

SLR-VB – 189

Seat No.	

B.E. (Part – I) (Electronics & Telecommunication Engineering) Examination, 2017
Elective – I : ADVANCED TELECOMMUNICATION NETWORK

Day and Date : Tuesday, 9-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

2. Solve **any four** : **20**
   a) Explain how RFID tag and reader communication with each other.
   b) Explain the various operating modes supported by Bluethooth.
   c) Explain the concept of IP multimedia subsystem for NGN.
   d) Write a note on wimax advanced.
   e) Explain Metro optical networking.

3. Solve the following : **20**
   a) What do you mean by WMAN ? Explain its typical features and enumerate important physical layer parameters of IEEE 802.15.
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4. Solve **any four** : **20**
   a) Explain the conceptual structure of cooperative communication.
   b) List out the design considerations in cognitive radio.
   c) Draw the architecture of cognitive radio network.
   d) What are the special requirements of telehealthcare ?
   e) Discuss the applications of coopertaive communication.

5. Solve the following : **20**
   a) Discuss cognitive cycle with spectrum sensing, spectrum sharing, spectrum mobility and spectrum management.
   b) Discuss various implementation scenarios and issues related to cooperative communication.
   c) Explain how cooperative communication is used for telehealthcare.

Set S

SLR-VB – 190

Seat No.	

Set **P**

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
IMAGE PROCESSING (Elective – I)

Day and Date : Tuesday, 9-5-2017 Total 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* ***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 : 20

1. Choose the correct answers : **20**

1) If the distance between p and q is given by $[(x – s)^2 + (y – t)^2]^{1/2}$ then it is known as
   a) Mahalnobis distance b) D_4 distance
   c) Euclidean distance d) D_8 distance

2) The minimum no. of colors that can be reproduced faithfully by any system are
   a) 128 colors b) 256 safe colors
   c) 16777216 colors d) none

3) A measure of the degree to which a pure color is diluted by white light is given by
   a) Hue b) Intensity c) Cyan d) Saturation

4) The primary colors can be added to produce the secondary colors of light
   i) Magenta = red + blue ii) Cyan = green + blue iii) Yellow = red + white
   a) all three correct b) ii) and iii) correct
   c) i) and iii) correct d) i) and ii) correct

5) Suitable for enhancing white or gray detail embedded in dark regions of an image, especially when the black area dominant in size.
   a) inverse transformation b) power law transformation
   c) log transformation d) none

6) Histogram is narrow and centered toward the middle of the gray scale
   a) low contrast image b) high contrast image
   c) bright image d) none

7) The basic strategy behind weighing the center point the highest and then reducing the value of the coefficients as a function of increasing distance from the origin is simply an attempt to reduce blurring in the smoothing process is
   a) weighted average filter b) average filter
   c) high pass filter d) none

8) In image enhancement, $\nabla^2 f = \frac{\partial^2 f(x, y)}{\partial x^2} + \frac{\partial^2 f(x, y)}{\partial y^2}$ or

$\nabla^2 f = [f(x + 1, y) + f(x - 1, y) + f(x, y + 1) + f(x, y - 1) - 4f(x, y)]$ is
a) Gradient operator b) Laplace operator
c) Sobel operator d) Prewitt operator

9) The PDF of Gaussian noise is given by

a) $\frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{(z-\mu)^2}{2\sigma^2}}$ b) $\frac{1}{\sqrt{2\pi\sigma}} e^{\frac{(z-\mu)^2}{2\sigma^2}}$ c) $e^{-\frac{(z-\mu)^2}{2\sigma^2}}$ d) $-\frac{1}{\sqrt{2\pi\sigma}} e^{\frac{(z-\mu)^2}{2\sigma}}$

10) The specific manner and extent of thickening or thinning is controlled by the shape of the _____
a) dilation b) erosion c) structuring element d) opening element

11) The orthogonal vectors are those vectors whose dot product or inner product is zero, means
a) Two vectors are 90° apart and they do not have common information
b) Two vectors are 90° apart and they have common information
c) Two vectors are 180° apart and they do not have common information
d) Two vectors are 180° apart and they have common information

12) Fourier transform gives frequency information while Wavelet transform gives both Time and Frequency information
a) True b) False

13) Each sub-band of DWT is further decomposed in higher levels, is called
a) Pyramidal DWT b) Tree structured DWT
c) Wavelet packet decomposition d) None

14) Huffman coding is
a) non-block coding b) clock coding c) both a) and b) d) none

15) Blocking artifacts is the major problem with
a) Huffman coding b) Run-length coding
c) Block Transform coding d) None

16) _____ produces two values for every edge in an image.
a) second derivative b) first derivative c) third derivative d) none

17) _____ property of the second derivative is quite useful for locating the centres of thick edges.
a) one value b) zero-crossing property
c) zero value d) none

18) Thresholding, region based and watershed algorithm are the methods of
a) morphology b) spatial filtering c) image restoration d) segmentation

19) Edge is _____ concept where as region boundary is _____ idea.
a) global, local b) global, global c) local, local d) local, global

20) Minutia features are used in
a) Point detection b) finger printing c) face detection d) remote sensing

_____

SLR-VB – 190

Seat No.	

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
IMAGE PROCESSING (Elective – I)

Day and Date : Tuesday, 9-5-2017 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. Answer **any four** : **(4×5=20)**

a) Write a short note on noise model.

b) What are different steps in filtering images in frequency domain ?

c) Explain how digital image is represented.

d) What is opening morphological process ?

e) What do you mean by HSI model ?

3. Answer **any two** : **(2×10=20)**

a) Explain intensity slicing and intensity to color Transformation in terms of Pseudo-color image processing.

b) Perform sharpening in spatial domain by using median filtering for 5*5 image given below using 3*3 mask. Consider zero padding.

25	17	32	44	53
47	34	32	40	12
37	15	12	40	46
30	14	10	12	13
20	12	16	16	14

c) Explain Region filling and pruning morphological algorithms.

SECTION – II

4. Answer **any four** : **(4×5=20)**

   a) What is contour following used for boundary extraction ?

   b) Explain region splitting and marging with respect to region based segmentation.

   c) Derive a 2×2 Haar matrix.

   d) Write a note on Boundary descriptors.

   e) Explain how to detect edge.

5. Answer **any two** : **(2×10=20)**

   a) Explain image processing application in face detection.

   OR

   a) State and explain Baseline JPEG algorithm.

   b) Six symbols and there probabilities are given. Generate Huffman code and calculate average length of code word and entropy of source.

a1	a2	a3	a4	a5	a6
0.2	0.3	0.06	0.25	0.04	0.15

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SLR-VB – 190

Seat No.	

Set **Q**

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
IMAGE PROCESSING (Elective – I)

Day and Date : Tuesday, 9-5-2017 Total 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* ***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 : 20

1. Choose the correct answers : **20**

1) _____ produces two values for every edge in an image.
a) second derivative b) first derivative c) third derivative d) none

2) _____ property of the second derivative is quite useful for locating the centres of thick edges.
a) one value b) zero-crossing property
c) zero value d) none

3) Thresholding, region based and watershed algorithm are the methods of
a) morphology b) spatial filtering c) image restoration d) segmentation

4) Edge is _____ concept where as region boundary is _____ idea.
a) global, local b) global, global c) local, local d) local, global

5) Minutia features are used in
a) Point detection b) finger printing c) face detection d) remote sensing

6) If the distance between p and q is given by $[(x - s)^2 + (y - t)^2]^{1/2}$ then it is known as
a) Mahalnobis distance b) D_4 distance
c) Euclidean distance d) D_8 distance

7) The minimum no. of colors that can be reproduced faithfully by any system are
a) 128 colors b) 256 safe colors
c) 16777216 colors d) none

8) A measure of the degree to which a pure color is diluted by white light is given by
a) Hue b) Intensity c) Cyan d) Saturation

9) The primary colors can be added to produce the secondary colors of light
i) Magenta = red + blue ii) Cyan = green + blue iii) Yellow = red + white
a) all three correct b) ii) and iii) correct
c) i) and iii) correct d) i) and ii) correct

P.T.O.

10) Suitable for enhancing white or gray detail embedded in dark regions of an image, especially when the black area dominant in size.
a) inverse transformation b) power law transformation
c) log transformation d) none

11) Histogram is narrow and centered toward the middle of the gray scale
a) low contrast image b) high contrast image
c) bright image d) none

12) The basic strategy behind weighing the center point the highest and then reducing the value of the coefficients as a function of increasing distance from the origin is simply an attempt to reduce blurring in the smoothing process is
a) weighted average filter b) average filter
c) high pass filter d) none

13) In image enhancement, $\nabla^2 f = \frac{\partial^2 f(x, y)}{\partial x^2} + \frac{\partial^2 f(x, y)}{\partial y^2}$ or

$\nabla^2 f = [f(x + 1, y) + f(x - 1, y) + f(x, y + 1) + f(x, y - 1) - 4f(x, y)]$ is
a) Gradient operator b) Laplace operator
c) Sobel operator d) Prewitt operator

14) The PDF of Gaussian noise is given by

a) $\frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{(z-\mu)^2}{2\sigma^2}}$ b) $\frac{1}{\sqrt{2\pi\sigma}} e^{\frac{(z-\mu)^2}{2\sigma^2}}$ c) $e^{-\frac{(z-\mu)^2}{2\sigma^2}}$ d) $-\frac{1}{\sqrt{2\pi\sigma}} e^{\frac{(z-\mu)^2}{2\sigma}}$

15) The specific manner and extent of thickening or thinning is controlled by the shape of the _____
a) dilation b) erosion c) structuring element d) opening element

16) The orthogonal vectors are those vectors whose dot product or inner product is zero, means
a) Two vectors are 90° apart and they do not have common information
b) Two vectors are 90° apart and they have common information
c) Two vectors are 180° apart and they do not have common information
d) Two vectors are 180° apart and they have common information

17) Fourier transform gives frequency information while Wavelet transform gives both Time and Frequency information
a) True b) False

18) Each sub-band of DWT is further decomposed in higher levels, is called
a) Pyramidal DWT b) Tree structured DWT
c) Wavelet packet decomposition d) None

19) Huffman coding is
a) non-block coding b) clock coding c) both a) and b) d) none

20) Blocking artifacts is the major problem with
a) Huffman coding b) Run-length coding
c) Block Transform coding d) None

SLR-VB – 190

Seat No.	

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
IMAGE PROCESSING (Elective – I)

Day and Date : Tuesday, 9-5-2017 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. Answer **any four** : **(4×5=20)**

a) Write a short note on noise model.

b) What are different steps in filtering images in frequency domain ?

c) Explain how digital image is represented.

d) What is opening morphological process ?

e) What do you mean by HSI model ?

3. Answer **any two** : **(2×10=20)**

a) Explain intensity slicing and intensity to color Transformation in terms of Pseudo-color image processing.

b) Perform sharpening in spatial domain by using median filtering for 5*5 image given below using 3*3 mask. Consider zero padding.

25	17	32	44	53
47	34	32	40	12
37	15	12	40	46
30	14	10	12	13
20	12	16	16	14

c) Explain Region filling and pruning morphological algorithms.

SECTION – II

4. Answer **any four** : **(4×5=20)**

   a) What is contour following used for boundary extraction ?

   b) Explain region splitting and marging with respect to region based segmentation.

   c) Derive a 2×2 Haar matrix.

   d) Write a note on Boundary descriptors.

   e) Explain how to detect edge.

5. Answer **any two** : **(2×10=20)**

   a) Explain image processing application in face detection.

   OR

   a) State and explain Baseline JPEG algorithm.

   b) Six symbols and there probabilities are given. Generate Huffman code and calculate average length of code word and entropy of source.

a1	a2	a3	a4	a5	a6
0.2	0.3	0.06	0.25	0.04	0.15

———————————

SLR-VB – 190

Seat No.	

Set **R**

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
IMAGE PROCESSING (Elective – I)

Day and Date : Tuesday, 9-5-2017 Total 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 **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 : 20

1. Choose the correct answers : **20**

1) The orthogonal vectors are those vectors whose dot product or inner product is zero, means
   a) Two vectors are 90° apart and they do not have common information
   b) Two vectors are 90° apart and they have common information
   c) Two vectors are 180° apart and they do not have common information
   d) Two vectors are 180° apart and they have common information

2) Fourier transform gives frequency information while Wavelet transform gives both Time and Frequency information
   a) True b) False

3) Each sub-band of DWT is further decomposed in higher levels, is called
   a) Pyramidal DWT b) Tree structured DWT
   c) Wavelet packet decomposition d) None

4) Huffman coding is
   a) non-block coding b) clock coding c) both a) and b) d) none

5) Blocking artifacts is the major problem with
   a) Huffman coding b) Run-length coding
   c) Block Transform coding d) None

6) _____ produces two values for every edge in an image.
   a) second derivative b) first derivative c) third derivative d) none

7) _____ property of the second derivative is quite useful for locating the centres of thick edges.
   a) one value b) zero-crossing property c) zero value d) none

8) Thresholding, region based and watershed algorithm are the methods of
   a) morphology b) spatial filtering c) image restoration d) segmentation

P.T.O.

9) Edge is _____ concept where as region boundary is _____ idea.
a) global, local b) global, global c) local, local d) local, global

10) Minutia features are used in
a) Point detection b) finger printing c) face detection d) remote sensing

11) If the distance between p and q is given by $[(x - s)^2 + (y - t)^2]^{1/2}$ then it is known as
a) Mahalnobis distance b) D_4 distance
c) Euclidean distance d) D_8 distance

12) The minimum no. of colors that can be reproduced faithfully by any system are
a) 128 colors b) 256 safe colors
c) 16777216 colors d) none

13) A measure of the degree to which a pure color is diluted by white light is given by
a) Hue b) Intensity c) Cyan d) Saturation

14) The primary colors can be added to produce the secondary colors of light
i) Magenta = red + blue ii) Cyan = green + blue iii) Yellow = red + white
a) all three correct b) ii) and iii) correct
c) i) and iii) correct d) i) and ii) correct

15) Suitable for enhancing white or gray detail embedded in dark regions of an image, especially when the black area dominant in size.
a) inverse transformation b) power law transformation
c) log transformation d) none

16) Histogram is narrow and centered toward the middle of the gray scale
a) low contrast image b) high contrast image
c) bright image d) none

17) The basic strategy behind weighing the center point the highest and then reducing the value of the coefficients as a function of increasing distance from the origin is simply an attempt to reduce blurring in the smoothing process is
a) weighted average filter b) average filter
c) high pass filter d) none

18) In image enhancement, $\nabla^2 f = \frac{\partial^2 f(x, y)}{\partial x^2} + \frac{\partial^2 f(x, y)}{\partial y^2}$ or

$\nabla^2 f = [f(x + 1, y) + f(x - 1, y) + f(x, y + 1) + f(x, y - 1) - 4f(x, y)]$ is
a) Gradient operator b) Laplace operator
c) Sobel operator d) Prewitt operator

19) The PDF of Gaussian noise is given by

a) $\frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{(z-\mu)^2}{2\sigma^2}}$ b) $\frac{1}{\sqrt{2\pi\sigma}} e^{\frac{(z-\mu)^2}{2\sigma^2}}$ c) $e^{-\frac{(z-\mu)^2}{2\sigma^2}}$ d) $-\frac{1}{\sqrt{2\pi\sigma}} e^{\frac{(z-\mu)^2}{2\sigma}}$

20) The specific manner and extent of thickening or thinning is controlled by the shape of the _____
a) dilation b) erosion c) structuring element d) opening element

_____

SLR-VB – 190

Seat No.	

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
IMAGE PROCESSING (Elective – I)

Day and Date : Tuesday, 9-5-2017 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. Answer **any four** : **(4×5=20)**

a) Write a short note on noise model.

b) What are different steps in filtering images in frequency domain ?

c) Explain how digital image is represented.

d) What is opening morphological process ?

e) What do you mean by HSI model ?

3. Answer **any two** : **(2×10=20)**

a) Explain intensity slicing and intensity to color Transformation in terms of Pseudo-color image processing.

b) Perform sharpening in spatial domain by using median filtering for 5*5 image given below using 3*3 mask. Consider zero padding.

25	17	32	44	53
47	34	32	40	12
37	15	12	40	46
30	14	10	12	13
20	12	16	16	14

c) Explain Region filling and pruning morphological algorithms.

SECTION – II

4. Answer **any four** : **(4×5=20)**

   a) What is contour following used for boundary extraction ?

   b) Explain region splitting and marging with respect to region based segmentation.

   c) Derive a 2×2 Haar matrix.

   d) Write a note on Boundary descriptors.

   e) Explain how to detect edge.

5. Answer **any two** : **(2×10=20)**

   a) Explain image processing application in face detection.

   OR

   a) State and explain Baseline JPEG algorithm.

   b) Six symbols and there probabilities are given. Generate Huffman code and calculate average length of code word and entropy of source.

a1	a2	a3	a4	a5	a6
0.2	0.3	0.06	0.25	0.04	0.15

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SLR-VB – 190

Seat No.	

Set S

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
IMAGE PROCESSING (Elective – I)

Day and Date : Tuesday, 9-5-2017 Total 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* ***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 : 20

1. Choose the correct answers : **20**

1) Histogram is narrow and centered toward the middle of the gray scale
   a) low contrast image b) high contrast image
   c) bright image d) none

2) The basic strategy behind weighing the center point the highest and then reducing the value of the coefficients as a function of increasing distance from the origin is simply an attempt to reduce blurring in the smoothing process is
   a) weighted average filter b) average filter c) high pass filter d) none

3) In image enhancement, $\nabla^2 f = \frac{\partial^2 f(x, y)}{\partial x^2} + \frac{\partial^2 f(x, y)}{\partial y^2}$ or

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   a) Gradient operator b) Laplace operator
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4) The PDF of Gaussian noise is given by

   a) $\frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{(z-\mu)^2}{2\sigma^2}}$ b) $\frac{1}{\sqrt{2\pi\sigma}} e^{\frac{(z-\mu)^2}{2\sigma^2}}$ c) $e^{-\frac{(z-\mu)^2}{2\sigma^2}}$ d) $-\frac{1}{\sqrt{2\pi\sigma}} e^{\frac{(z-\mu)^2}{2\sigma}}$

5) The specific manner and extent of thickening or thinning is controlled by the shape of the _____
   a) dilation b) erosion c) structuring element d) opening element

6) The orthogonal vectors are those vectors whose dot product or inner product is zero, means
   a) Two vectors are 90° apart and they do not have common information
   b) Two vectors are 90° apart and they have common information
   c) Two vectors are 180° apart and they do not have common information
   d) Two vectors are 180° apart and they have common information

P.T.O.

7) Fourier transform gives frequency information while Wavelet transform gives both Time and Frequency information
   a) True b) False

8) Each sub-band of DWT is further decomposed in higher levels, is called
   a) Pyramidal DWT b) Tree structured DWT
   c) Wavelet packet decomposition d) None

9) Huffman coding is
   a) non-block coding b) clock coding c) both a) and b) d) none

10) Blocking artifacts is the major problem with
   a) Huffman coding b) Run-length coding
   c) Block Transform coding d) None

11) _____ produces two values for every edge in an image.
   a) second derivative b) first derivative c) third derivative d) none

12) _____ property of the second derivative is quite useful for locating the centres of thick edges.
   a) one value b) zero-crossing property
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13) Thresholding, region based and watershed algorithm are the methods of
   a) morphology b) spatial filtering c) image restoration d) segmentation

14) Edge is _____ concept where as region boundary is _____ idea.
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15) Minutia features are used in
   a) Point detection b) finger printing c) face detection d) remote sensing

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   c) Euclidean distance d) D_8 distance

17) The minimum no. of colors that can be reproduced faithfully by any system are
   a) 128 colors b) 256 safe colors
   c) 16777216 colors d) none

18) A measure of the degree to which a pure color is diluted by white light is given by
   a) Hue b) Intensity c) Cyan d) Saturation

19) The primary colors can be added to produce the secondary colors of light
   i) Magenta = red + blue ii) Cyan = green + blue iii) Yellow = red + white
   a) all three correct b) ii) and iii) correct
   c) i) and iii) correct d) i) and ii) correct

20) Suitable for enhancing white or gray detail embedded in dark regions of an image, especially when the black area dominant in size.
   a) inverse transformation b) power law transformation
   c) log transformation d) none

SLR-VB – 190

Seat No.	

B.E. (Electronics and Telecommunication) (Part – I) Examination, 2017
IMAGE PROCESSING (Elective – I)

Day and Date : Tuesday, 9-5-2017 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. Answer **any four** : **(4×5=20)**

a) Write a short note on noise model.

b) What are different steps in filtering images in frequency domain ?

c) Explain how digital image is represented.

d) What is opening morphological process ?

e) What do you mean by HSI model ?

3. Answer **any two** : **(2×10=20)**

a) Explain intensity slicing and intensity to color Transformation in terms of Pseudo-color image processing.

b) Perform sharpening in spatial domain by using median filtering for 5*5 image given below using 3*3 mask. Consider zero padding.

25	17	32	44	53
47	34	32	40	12
37	15	12	40	46
30	14	10	12	13
20	12	16	16	14

c) Explain Region filling and pruning morphological algorithms.

SECTION – II

4. Answer **any four** : **(4×5=20)**

   a) What is contour following used for boundary extraction ?

   b) Explain region splitting and marging with respect to region based segmentation.

   c) Derive a 2×2 Haar matrix.

   d) Write a note on Boundary descriptors.

   e) Explain how to detect edge.

5. Answer **any two** : **(2×10=20)**

   a) Explain image processing application in face detection.

   OR

   a) State and explain Baseline JPEG algorithm.

   b) Six symbols and there probabilities are given. Generate Huffman code and calculate average length of code word and entropy of source.

a1	a2	a3	a4	a5	a6
0.2	0.3	0.06	0.25	0.04	0.15

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SLR-VB – 191

Seat No.	

Set **P**

B.E. (E & TC) (Part – I) Examination, 2017
Elective – I : ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date : Tuesday, 9-5-2017 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) Figures to the ***right*** *indicate* ***full*** *marks.*
5) Assume suitable data, if required.

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) One that is not a part of digital filter
a) Unit delay b) Multiplier c) Subtractor d) Adder

2) The function changing the shape is called
a) Scaling function b) Shaping function
c) Down sampling d) Blurring

3) Diagonally opposed filters is said to be
a) Modulation b) Multiplier
c) Cross modulation d) Subband coding

4) Subband of input image, showing a(m, n) is called
a) Approximation b) Vertical detail c) Horizontal detail d) Diagonal detail

5) Decomposition in subband coding is performed to
a) Segment image b) reconstruct image
c) Blur image d) Sharpened image

6) SRAM (Static RAM memory) :
a) Higher integration density wr. t. DRAM
b) Store information as charge in a capacitance
c) Are based on FFs (Flip Flops)
d) None of these

7) The capability of a DSP to handle circular buffer in hardware can be profitably exploited to
a) Implement FIR filter but not IIR filter
b) Implement IIR filter but not FIR filter
c) Implement both FIR and IIR filter
d) None

8) With 4-bit quantization in a DSP, how many quantization levels are there ?
a) 4 b) 8 c) 16 d) 32

P.T.O.

9) The Fourier transform of autocorrelation function is given as F{Rxx(1)} i.e. equivalent to
   a) |X(f)|2 b) |X(f)/2|2 c) 1 d) 0

10) FFT length in Bartlett method is
   a) zero b) one c) $L = 0.9/\Delta f$ d) None

11) In multiresolution processing * represents the
   a) Complete conjugate operation b) Complex conjugate operation
   c) Complete complex operation d) Complex complex operation

12) What is the result of taking more samples during the quantization process ?
   a) More errors in the ADC
   b) More bit requirements
   c) More accurate signal representation
   d) More bit requirements and more accurate signal representation

13) Adaptive filters are often realized as
   a) Instructions running on an microprocessor or DSP chip
   b) Set of logic operations implemented in a (FPGA) or in a custom VLSI integrated circuit
   c) A set of program
   d) Can be any of these

14) A linear predictor can be used to in such a way as to
   a) model the signal correlations for a short block of data
   b) reduce the number of bits needed to represent the signal waveform
   c) Both a and b
   d) Neither a nor b

15) The principal 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) DWT stands for
   a) Discrete Wavelet Transform b) Discrete Wavelet Transformation
   c) Digital Wavelet Transform d) Digital Wavelet Transformation

18) Narrow wavelets represents
   a) Sharp details b) Finer details c) Blur details d) Edge details

19) The difference equation of ARMA (p, q) model is given by

   a) $y(n) = -\sum_{k=1}^{p} A_k w(n-k)$ b) $y(n) = -\sum_{k=1}^{p} A_k w(n-k) + \sum_{k=0}^{q} B_k w(n-k)$

   c) $y(n) = -\sum_{k=0}^{q} B_k w(n-k)$ d) None

20) Automatic removal of error is known as _____ filtration.
   a) simple b) Adaptive c) Non adaptive d) None

_____

SLR-VB – 191

Seat No.	

B.E. (E & TC) (Part – I) Examination, 2017
Elective – I : ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date : Tuesday, 9-5-2017 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 Radix-2 Decimation in frequency FFT structure.
   b) With reference to wavelet transform derive the relation for resolution for system.
   c) Explain the properties of wavelet transform.
   d) Explain the concept of Interpolation in multirate signal processing.
   e) Draw the structure of N = 8 point DIT FFT structure.

3. Attempt **any two** of the following : **(2×10=20)**
   a) Discuss sampling rate conversion by a rational factor.
   b) How are multirate systems used in sub band coding of speech and image signals.
   c) Write short notes on wavelet transformation.

SECTION – II

4. Attempt **any four** of the following : **(4×5=20)**
   a) Explain LMS adaptive algorithm.
   b) Explain the ARMA model in detail.
   c) Compare various methods for spectrum estimation.
   d) How DFT is used to calculate power density spectrum ?
   e) How the property of ergodicity can be made use of for estimation of autocorrelation of a random process ?

5. Attempt **any two** of the following : **(2×10=20)**
   a) Explain with block diagram the computer architecture for signal processing.
   b) Explain RLS algorithm.
   c) Derive the spectral factorization of a power spectrum $p_x(e^{jw})$.

Set P

SLR-VB – 191

Seat No.	

Set **Q**

B.E. (E & TC) (Part – I) Examination, 2017
Elective – I : ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date : Tuesday, 9-5-2017 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) Figures to the **right** indicate **full** marks.*
5) Assume suitable data, if required.

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) Modern day equalization is based on
   a) Conventional filter b) Digital filters
   c) Adaptive filters d) None of these

2) DWT stands for
   a) Discrete Wavelet Transform b) Discrete Wavelet Transformation
   c) Digital Wavelet Transform d) Digital Wavelet Transformation

3) Narrow wavelets represents
   a) Sharp details b) Finer details c) Blur details d) Edge details

4) The difference equation of ARMA (p, q) model is given by

   a) $y(n) = -\sum_{k=1}^{p} A_k\, w(n-k)$ b) $y(n) = -\sum_{k=1}^{p} A_k\, w(n-k) + \sum_{k=0}^{q} B_k\, w(n-k)$

   c) $y(n) = -\sum_{k=0}^{q} B_k\, w(n-k)$ d) None

5) Automatic removal of error is known as _____ filtration.
   a) simple b) Adaptive c) Non adaptive d) None

6) One that is not a part of digital filter
   a) Unit delay b) Multiplier c) Subtractor d) Adder

7) The function changing the shape is called
   a) Scaling function b) Shaping function
   c) Down sampling d) Blurring

8) Diagonally opposed filters is said to be
   a) Modulation b) Multiplier
   c) Cross modulation d) Subband coding

P.T.O.

9) Subband of input image, showing a(m, n) is called
   a) Approximation b) Vertical detail c) Horizontal detail d) Diagonal detail

10) Decomposition in subband coding is performed to
   a) Segment image b) reconstruct image
   c) Blur image d) Sharpened image

11) SRAM (Static RAM memory) :
   a) Higher integration density wr. t. DRAM
   b) Store information as charge in a capacitance
   c) Are based on FFs (Flip Flops)
   d) None of these

12) The capability of a DSP to handle circular buffer in hardware can be profitably exploited to
   a) Implement FIR filter but not IIR filter
   b) Implement IIR filter but not FIR filter
   c) Implement both FIR and IIR filter
   d) None

13) With 4-bit quantization in a DSP, how many quantization levels are there ?
   a) 4 b) 8 c) 16 d) 32

14) The Fourier transform of autocorrelation function is given as F{Rxx(1)} i.e. equivalent to
   a) |X(f)|2 b) |X(f)/2|2 c) 1 d) 0

15) FFT length in Bartlett method is
   a) zero b) one c) $L = 0.9/\Delta f$ d) None

16) In multiresolution processing * represents the
   a) Complete conjugate operation b) Complex conjugate operation
   c) Complete complex operation d) Complex complex operation

17) What is the result of taking more samples during the quantization process ?
   a) More errors in the ADC
   b) More bit requirements
   c) More accurate signal representation
   d) More bit requirements and more accurate signal representation

18) Adaptive filters are often realized as
   a) Instructions running on an microprocessor or DSP chip
   b) Set of logic operations implemented in a (FPGA) or in a custom VLSI integrated circuit
   c) A set of program
   d) Can be any of these

19) A linear predictor can be used to in such a way as to
   a) model the signal correlations for a short block of data
   b) reduce the number of bits needed to represent the signal waveform
   c) Both a and b
   d) Neither a nor b

20) The principal of orthogonality is used in
   a) Multirate signal processing b) Wavelet transformation
   c) Weiner filtering d) Conventional filtering

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SLR-VB – 191

Seat No.	

B.E. (E & TC) (Part – I) Examination, 2017
Elective – I : ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date : Tuesday, 9-5-2017 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 Radix-2 Decimation in frequency FFT structure.
   b) With reference to wavelet transform derive the relation for resolution for system.
   c) Explain the properties of wavelet transform.
   d) Explain the concept of Interpolation in multirate signal processing.
   e) Draw the structure of N = 8 point DIT FFT structure.

3. Attempt **any two** of the following : **(2×10=20)**
   a) Discuss sampling rate conversion by a rational factor.
   b) How are multirate systems used in sub band coding of speech and image signals.
   c) Write short notes on wavelet transformation.

SECTION – II

4. Attempt **any four** of the following : **(4×5=20)**
   a) Explain LMS adaptive algorithm.
   b) Explain the ARMA model in detail.
   c) Compare various methods for spectrum estimation.
   d) How DFT is used to calculate power density spectrum ?
   e) How the property of ergodicity can be made use of for estimation of autocorrelation of a random process ?

5. Attempt **any two** of the following : **(2×10=20)**
   a) Explain with block diagram the computer architecture for signal processing.
   b) Explain RLS algorithm.
   c) Derive the spectral factorization of a power spectrum $p_x(e^{jw})$.

Set Q

Set Q

SLR-VB – 191

Seat No.	

Set **R**

B.E. (E & TC) (Part – I) Examination, 2017
Elective – I : ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date : Tuesday, 9-5-2017 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) Figures to the ***right*** *indicate* ***full*** *marks.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) In multiresolution processing * represents the
   a) Complete conjugate operation b) Complex conjugate operation
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2) What is the result of taking more samples during the quantization process ?
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   d) Neither a nor b

5) The principal of orthogonality is used in
   a) Multirate signal processing b) Wavelet transformation
   c) Weiner filtering d) Conventional filtering

6) Modern day equalization is based on
   a) Conventional filter b) Digital filters
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P.T.O.

7) DWT stands for
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   b) Discrete Wavelet Transformation
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8) Narrow wavelets represents
   a) Sharp details b) Finer details c) Blur details d) Edge details

9) The difference equation of ARMA (p, q) model is given by

   a) $y(n) = -\sum_{k=1}^{p} A_k w(n-k)$
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   c) $y(n) = -\sum_{k=0}^{q} B_k w(n-k)$
   d) None

10) Automatic removal of error is known as _____ filtration.
   a) simple b) Adaptive c) Non adaptive d) None

11) One that is not a part of digital filter
   a) Unit delay b) Multiplier c) Subtractor d) Adder

12) The function changing the shape is called
   a) Scaling function
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   d) Blurring

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_____

SLR-VB – 191

Seat No.	

B.E. (E & TC) (Part – I) Examination, 2017
Elective – I : ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date : Tuesday, 9-5-2017 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** of the following : **(4×5=20)**
   a) Explain Radix-2 Decimation in frequency FFT structure.
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   c) Explain the properties of wavelet transform.
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   e) Draw the structure of N = 8 point DIT FFT structure.

3. Attempt **any two** of the following : **(2×10=20)**
   a) Discuss sampling rate conversion by a rational factor.
   b) How are multirate systems used in sub band coding of speech and image signals.
   c) Write short notes on wavelet transformation.

SECTION – II

4. Attempt **any four** of the following : **(4×5=20)**
   a) Explain LMS adaptive algorithm.
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   c) Compare various methods for spectrum estimation.
   d) How DFT is used to calculate power density spectrum ?
   e) How the property of ergodicity can be made use of for estimation of autocorrelation of a random process ?

5. Attempt **any two** of the following : **(2×10=20)**
   a) Explain with block diagram the computer architecture for signal processing.
   b) Explain RLS algorithm.
   c) Derive the spectral factorization of a power spectrum $p_x(e^{jw})$.

Set R

SLR-VB – 191

Seat No.	

Set **S**

B.E. (E & TC) (Part – I) Examination, 2017
Elective – I : ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date : Tuesday, 9-5-2017 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 alternative : **(1×20=20)**

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   a) |X(f)|2 b) |X(f)/2|2 c) 1 d) 0

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   a) More errors in the ADC
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P.T.O.

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   a) Multirate signal processing
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   d) Conventional filtering

11) Modern day equalization is based on
   a) Conventional filter
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   c) Adaptive filters
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12) DWT stands for
   a) Discrete Wavelet Transform
   b) Discrete Wavelet Transformation
   c) Digital Wavelet Transform
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   b) $y(n) = -\sum_{k=1}^{p} A_k w(n-k) + \sum_{k=0}^{q} B_k w(n-k)$
   c) $y(n) = -\sum_{k=0}^{q} B_k w(n-k)$
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   a) simple b) Adaptive c) Non adaptive d) None

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18) Diagonally opposed filters is said to be
   a) Modulation
   b) Multiplier
   c) Cross modulation
   d) Subband coding

19) Subband of input image, showing a(m, n) is called
   a) Approximation b) Vertical detail c) Horizontal detail d) Diagonal detail

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   a) Segment image
   b) reconstruct image
   c) Blur image
   d) Sharpened image

_____

SLR-VB – 191

Seat No.	

B.E. (E & TC) (Part – I) Examination, 2017
Elective – I : ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date : Tuesday, 9-5-2017 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 Radix-2 Decimation in frequency FFT structure.
   b) With reference to wavelet transform derive the relation for resolution for system.
   c) Explain the properties of wavelet transform.
   d) Explain the concept of Interpolation in multirate signal processing.
   e) Draw the structure of N = 8 point DIT FFT structure.

3. Attempt **any two** of the following : **(2×10=20)**
   a) Discuss sampling rate conversion by a rational factor.
   b) How are multirate systems used in sub band coding of speech and image signals.
   c) Write short notes on wavelet transformation.

SECTION – II

4. Attempt **any four** of the following : **(4×5=20)**
   a) Explain LMS adaptive algorithm.
   b) Explain the ARMA model in detail.
   c) Compare various methods for spectrum estimation.
   d) How DFT is used to calculate power density spectrum ?
   e) How the property of ergodicity can be made use of for estimation of autocorrelation of a random process ?

5. Attempt **any two** of the following : **(2×10=20)**
   a) Explain with block diagram the computer architecture for signal processing.
   b) Explain RLS algorithm.
   c) Derive the spectral factorization of a power spectrum $p_x(e^{jw})$.

Set S

Set S

SLR-VB – 192

Seat No.	

Set **P**

B.E. (Electronics and Telecommunication Engineering)
(Part – II) Examination, 2017
BROADBAND COMMUNICATION

Day and Date : Tuesday, 16-5-2017 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) Which of the following is slower but reliable frame mode protocol ?
   a) Frame relay b) Packet switching
   c) Circuit switching d) Frame switching

2) X.25 is standard for _____ .
   a) Frame relay b) Packet switching
   c) Cell relay d) None

3) ISDN stands for _____ .
   a) International standard digital network
   b) Integrated standard digital network
   c) Integrated services digital network
   d) None

4) ISDN uses _____ as basic access data rate.
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) 2 Mbps

5) Modulation-demodulation is not required at every hop of a network using _____
   a) Bridge b) Analog switch c) Digital switch d) Circuit switch

6) Maximum capacity with primary access of ISDN is _____ .
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) None

7) The main control signaling channel for ordinary ISDN user is _____
   a) B channel b) D channel c) H channel d) H0 channel

8) Basic access means _____
   a) 23B + 2D b) 23B + 1D c) 2B + D d) B + D
9) X.25 protocol uses _____ as PDU (Protocol Data Unit).
   a) Frame b) Packet c) Cell d) None
10) HEC is function of _____ layer.
   a) AAL b) ATM c) Physical d) Data Link
11) Email is example of _____ service.
   a) Interactive b) Distribution c) Broadcast d) None
12) Bundle of virtual channels make virtual _____
   a) circuit b) path c) cells d) connections
13) Information field size in ATM cell is made up of _____
   a) 48 bytes b) 53 bytes c) 64 bytes d) 5 bytes
14) AAL type 2 means _____
   a) connection oriented, constant bit rate
   b) connection oriented, variable bit rate
   c) connectionless, constant bit rate
   d) connectionless, variable bit rate
15) Flow control is achieved using _____ field inside ATM cell.
   a) GFC b) HEC c) VPI-VCI d) Payload type
16) ATM switching network is made up of switching _____
   a) elements b) paths c) cells d) frames
17) Output lines are same as input lines in case of _____ ATM network.
   a) Funnel type b) Shuffle exchange
   c) Matrix type d) None
18) _____ buffering method gives high efficiency.
   a) Input buffers b) Output buffers
   c) Crosspoint buffers d) None
19) ATM is said to be a connection oriented technology. What does this mean and why is it necessary ?
   a) Cells travels through the same path to the receiver. By this, cell do not have to be rearranged
   b) Cells travels through different paths. Therefore cells can reach the receiver faster
   c) A path is reserved exclusively for one user. Arrangement of cells is not necessary
   d) Cells are transmitted using fibre optic cables. Cells would be less susceptible to errors
20) ATM stands for _____
   a) All time money b) Asynchronous transfer mode
   c) Asynchronous transferable machine d) Asynchronous transfer machine

_____

SLR-VB – 192

Seat No.	

B.E. (Electronics and Telecommunication Engineering)
(Part – II) Examination, 2017
BROADBAND COMMUNICATION

Day and Date : Tuesday, 16-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four**. **(4×5=20)**
   a) Explain link layer core parameters and link layer protocol parameters.
   b) Compare frame relay and frame switching.
   c) What are the key objectives for development of ISDN ?
   d) Explain the call negotiation procedure in ISDN-ISDN interworking used to reach service agreement.
   e) Explain the ISDN address structure.

3. Attempt **any two**. **(2×10=20)**
   a) What is X.25 ? Explain internal operation and external service.
   b) Draw and explain user interface to ISDN.
   c) Explain in detail transmission structure of ISDN.

SECTION – II

4. Attempt **any four**. **(4×5=20)**
   a) Explain on SONET signal hierarchy.
   b) Draw and explain B-ISDN user network interface.
   c) Write a note on Header Error Control (HEC) mechanism used in ATM.
   d) Explain AAL type1 protocol for ATM.
   e) Explain ATM switching principle and requirements.

5. Attempt **any two**. **(2×10=20)**
   a) Explain various broadband services.
   b) Draw and explain in detail ATM cell formats.
   c) Explain in detail ATM cell processing in a switch.

SLR-VB – 192

Seat No.	

Set **Q**

B.E. (Electronics and Telecommunication Engineering)
(Part – II) Examination, 2017
BROADBAND COMMUNICATION

Day and Date : Tuesday, 16-5-2017 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.*

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer : **20**

1) ATM switching network is made up of switching _____
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P.T.O.

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_____

SLR-VB – 192

Seat No.	

B.E. (Electronics and Telecommunication Engineering)
(Part – II) Examination, 2017
BROADBAND COMMUNICATION

Day and Date : Tuesday, 16-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four**. **(4×5=20)**
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SECTION – II

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   d) Explain AAL type1 protocol for ATM.
   e) Explain ATM switching principle and requirements.

5. Attempt **any two**. **(2×10=20)**
   a) Explain various broadband services.
   b) Draw and explain in detail ATM cell formats.
   c) Explain in detail ATM cell processing in a switch.

Set Q

Set Q

SLR-VB – 192

Seat No.	

Set **R**

B.E. (Electronics and Telecommunication Engineering)
(Part – II) Examination, 2017
BROADBAND COMMUNICATION

Day and Date : Tuesday, 16-5-2017 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) Email is example of _____ service.
   a) Interactive b) Distribution c) Broadcast d) None

2) Bundle of virtual channels make virtual _____
   a) circuit b) path c) cells d) connections

3) Information field size in ATM cell is made up of _____
   a) 48 bytes b) 53 bytes c) 64 bytes d) 5 bytes

4) AAL type 2 means _____
   a) connection oriented, constant bit rate
   b) connection oriented, variable bit rate
   c) connectionless, constant bit rate
   d) connectionless, variable bit rate

5) Flow control is achieved using _____ field inside ATM cell.
   a) GFC b) HEC c) VPI-VCI d) Payload type

6) ATM switching network is made up of switching _____
   a) elements b) paths c) cells d) frames

7) Output lines are same as input lines in case of _____ ATM network.
   a) Funnel type b) Shuffle exchange
   c) Matrix type d) None

8) _____ buffering method gives high efficiency.
   a) Input buffers b) Output buffers
   c) Crosspoint buffers d) None

P.T.O.

9) ATM is said to be a connection oriented technology. What does this mean and why is it necessary ?
   a) Cells travels through the same path to the receiver. By this, cell do not have to be rearranged
   b) Cells travels through different paths. Therefore cells can reach the receiver faster
   c) A path is reserved exclusively for one user. Arrangement of cells is not necessary
   d) Cells are transmitted using fibre optic cables. Cells would be less susceptible to errors

10) ATM stands for _____
   a) All time money
   b) Asynchronous transfer mode
   c) Asynchronous transferable machine
   d) Asynchronous transfer machine

11) Which of the following is slower but reliable frame mode protocol ?
   a) Frame relay
   b) Packet switching
   c) Circuit switching
   d) Frame switching

12) X.25 is standard for _____ .
   a) Frame relay
   b) Packet switching
   c) Cell relay
   d) None

13) ISDN stands for _____ .
   a) International standard digital network
   b) Integrated standard digital network
   c) Integrated services digital network
   d) None

14) ISDN uses _____ as basic access data rate.
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) 2 Mbps

15) Modulation-demodulation is not required at every hop of a network using _____
   a) Bridge b) Analog switch c) Digital switch d) Circuit switch

16) Maximum capacity with primary access of ISDN is _____ .
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) None

17) The main control signaling channel for ordinary ISDN user is _____
   a) B channel b) D channel c) H channel d) H0 channel

18) Basic access means _____
   a) 23B + 2D b) 23B + 1D c) 2B + D d) B + D

19) X.25 protocol uses _____ as PDU (Protocol Data Unit).
   a) Frame b) Packet c) Cell d) None

20) HEC is function of _____ layer.
   a) AAL b) ATM c) Physical d) Data Link

_____

SLR-VB – 192

Seat No.	

B.E. (Electronics and Telecommunication Engineering)
(Part – II) Examination, 2017
BROADBAND COMMUNICATION

Day and Date : Tuesday, 16-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four**. **(4×5=20)**
   a) Explain link layer core parameters and link layer protocol parameters.
   b) Compare frame relay and frame switching.
   c) What are the key objectives for development of ISDN ?
   d) Explain the call negotiation procedure in ISDN-ISDN interworking used to reach service agreement.
   e) Explain the ISDN address structure.

3. Attempt **any two**. **(2×10=20)**
   a) What is X.25 ? Explain internal operation and external service.
   b) Draw and explain user interface to ISDN.
   c) Explain in detail transmission structure of ISDN.

SECTION – II

4. Attempt **any four**. **(4×5=20)**
   a) Explain on SONET signal hierarchy.
   b) Draw and explain B-ISDN user network interface.
   c) Write a note on Header Error Control (HEC) mechanism used in ATM.
   d) Explain AAL type1 protocol for ATM.
   e) Explain ATM switching principle and requirements.

5. Attempt **any two**. **(2×10=20)**
   a) Explain various broadband services.
   b) Draw and explain in detail ATM cell formats.
   c) Explain in detail ATM cell processing in a switch.

Set R

SLR-VB – 192

Seat No.	

Set **S**

B.E. (Electronics and Telecommunication Engineering)
(Part – II) Examination, 2017
BROADBAND COMMUNICATION

Day and Date : Tuesday, 16-5-2017 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) Maximum capacity with primary access of ISDN is _____ .
   a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) None

2) The main control signaling channel for ordinary ISDN user is _____
   a) B channel b) D channel c) H channel d) H0 channel

3) Basic access means _____
   a) 23B + 2D b) 23B + 1D c) 2B + D d) B + D

4) X.25 protocol uses _____ as PDU (Protocol Data Unit).
   a) Frame b) Packet c) Cell d) None

5) HEC is function of _____ layer.
   a) AAL b) ATM c) Physical d) Data Link

6) Email is example of _____ service.
   a) Interactive b) Distribution c) Broadcast d) None

7) Bundle of virtual channels make virtual _____
   a) circuit b) path c) cells d) connections

8) Information field size in ATM cell is made up of _____
   a) 48 bytes b) 53 bytes c) 64 bytes d) 5 bytes

9) AAL type 2 means _____
   a) connection oriented, constant bit rate
   b) connection oriented, variable bit rate
   c) connectionless, constant bit rate
   d) connectionless, variable bit rate

P.T.O.

10) Flow control is achieved using _____ field inside ATM cell.
a) GFC b) HEC c) VPI-VCI d) Payload type

11) ATM switching network is made up of switching _____
a) elements b) paths c) cells d) frames

12) Output lines are same as input lines in case of _____ ATM network.
a) Funnel type b) Shuffle exchange
c) Matrix type d) None

13) _____ buffering method gives high efficiency.
a) Input buffers b) Output buffers
c) Crosspoint buffers d) None

14) ATM is said to be a connection oriented technology. What does this mean and why is it necessary ?
a) Cells travels through the same path to the receiver. By this, cell do not have to be rearranged
b) Cells travels through different paths. Therefore cells can reach the receiver faster
c) A path is reserved exclusively for one user. Arrangement of cells is not necessary
d) Cells are transmitted using fibre optic cables. Cells would be less susceptible to errors

15) ATM stands for _____
a) All time money b) Asynchronous transfer mode
c) Asynchronous transferable machine d) Asynchronous transfer machine

16) Which of the following is slower but reliable frame mode protocol ?
a) Frame relay b) Packet switching
c) Circuit switching d) Frame switching

17) X.25 is standard for _____ .
a) Frame relay b) Packet switching
c) Cell relay d) None

18) ISDN stands for _____ .
a) International standard digital network
b) Integrated standard digital network
c) Integrated services digital network
d) None

19) ISDN uses _____ as basic access data rate.
a) 192 Kbps b) 64 Kbps c) 1.5 Mbps d) 2 Mbps

20) Modulation-demodulation is not required at every hop of a network using _____
a) Bridge b) Analog switch c) Digital switch d) Circuit switch

_____

SLR-VB – 192

Seat No.	

B.E. (Electronics and Telecommunication Engineering)
(Part – II) Examination, 2017
BROADBAND COMMUNICATION

Day and Date : Tuesday, 16-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four**. **(4×5=20)**
   a) Explain link layer core parameters and link layer protocol parameters.
   b) Compare frame relay and frame switching.
   c) What are the key objectives for development of ISDN ?
   d) Explain the call negotiation procedure in ISDN-ISDN interworking used to reach service agreement.
   e) Explain the ISDN address structure.

3. Attempt **any two**. **(2×10=20)**
   a) What is X.25 ? Explain internal operation and external service.
   b) Draw and explain user interface to ISDN.
   c) Explain in detail transmission structure of ISDN.

SECTION – II

4. Attempt **any four**. **(4×5=20)**
   a) Explain on SONET signal hierarchy.
   b) Draw and explain B-ISDN user network interface.
   c) Write a note on Header Error Control (HEC) mechanism used in ATM.
   d) Explain AAL type1 protocol for ATM.
   e) Explain ATM switching principle and requirements.

5. Attempt **any two**. **(2×10=20)**
   a) Explain various broadband services.
   b) Draw and explain in detail ATM cell formats.
   c) Explain in detail ATM cell processing in a switch.

Set S

SLR-VB – 193

Seat No.	

Set P

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date : Thursday, 18-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: I)* ***All*** *questions are* ***compulsory****.*
II) Figures to ***right*** *indicate* ***full*** *marks.*
III) Q. No. ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
IV) ***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) A satellite relay station usually uses _____ band of frequencies for relaying T.V. signals.
a) HF b) VHF c) low UHF d) SHF

2) Highest capacity in an optical disc can be obtained by using laser beam of _____ light.
a) Green b) Red c) Blue d) Infrared

3) Encoding of colour and modulation of audio carrier use the following modulation techniques in SECAM system of France
a) A.M. for both b) F.M. for both
c) F.M. for colour and A.M. for audio d) A.M. for colour and F.M. for audio

4) The sync pulses are obtained by
a) Dividing colour sub carrier b) Using a separate oscillator
c) Using C.B. signal d) Using sweep signal

5) Weighting factor for U is
a) 0 b) 0.493 c) 0.877 d) 1

6) Sensitivity of the eye for red colour is _____ percent.
a) 11 b) 30 c) 50 d) 59

7) Value of sub carrier in PAL system is
a) 3.58 MHz b) 4.43 MHz c) 5 MHz d) 7 MHz

8) Vertical blanking uses _____ μ s duration in India.
a) 64 b) 100 c) 160 d) 1280

9) When is pre-emphasis done ?
a) Before recording b) After recording
c) Before detection d) After detection

10) What is the rotational speed (rpm) of the compact disc at the centre ?
a) 200 b) 500 c) 800 d) 100

11) Hardware that creates sound from a mathematical representation
a) Sound synthesizer b) Stampers
c) Speaker d) Sons

12) A video consists of sequence of
a) Frames b) Signals c) Packets d) Slots

13) _____ audio/video refers to on-demand requests for compressed audio/video files.
a) Streaming live b) Streaming stored
c) Interactive d) None of the above

14) _____ is a protocol for controlling the flow and quality of data.
a) RTP b) RTCP
c) UDP d) None of the above

15) A _____ adds signals from different sources to create a single signal.
a) Timestamp b) Sequence number
c) Mixer d) None of the above

16) _____ audio/video refers to the use of the internet for interactive audio/video applications.
a) Interactive b) Streaming live
c) Streaming stored d) None of the above

17) _____ is an application protocol that establishes, manages and terminates a multimedia session.
a) RIP b) SIP
c) DIP d) None of the above

18) _____ is not suitable for interactive multimedia traffic because it retransmits packets in case of errors.
a) UDP b) TCP
c) Both (a) and (b) d) None of the above

19) MIDI stands for
a) Musical Instrument Digital Interface
b) Musical Instrument Digital Instruction
c) MP3 Instrument Digital Interface
d) Musical Instrument Design Interface

20) A _____ buffer is required for real time traffic.
a) Play back b) Recording
c) Sorting d) None of the above

SLR-VB – 193

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date : Thursday, 18-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: I)* ***All*** *questions are* ***compulsory****.*
II) Figures to ***right*** *indicate* ***full*** *marks.*

SECTION – I

2. Attempt **any four** : **(5×4=20)**
   1) Explain principle of magnetic reproduction with the help of neat sketches.
   2) Explain working of video detector stage in T.V. receiver.
   3) Compare between DVD and CD.
   4) Why G-Y signal is not transmitted along with B-Y and R-Y signals ?
   5) Explain VSB modulation.
3. Attempt **any two** : **(10×2=20)**
   1) What is frequency interleaving ? With neat sketch explain how this method is helpful for accommodating colour information also explain what is colour subcarrier frequency.
   2) Draw a block diagram of SECAM transmitter and explain function of each block.
   3) Explain in detail DTH system.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   1) Explain 4 : 2 : 2 format.
   2) What are different media types ? Explain each media type in brief.
   3) Explain the term synthesized audio.
   4) What are the basic principles of multimedia ?
   5) Explain interpersonal communication.
5. Attempt **any two** : **(10×2=20)**
   1) Explain communication modes in multimedia.
   2) What is video compression ? What are different techniques of video compression ? Explain any one in detail.
   3) Explain broadband multiservice networks in detail.

Set P

Set P

SLR-VB – 193

Seat No.	

Set **Q**

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date : Thursday, 18-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: I)* ***All*** *questions are* ***compulsory****.*
II) Figures to ***right*** *indicate* ***full*** *marks.*
III) Q. No. ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
IV) ***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) _____ audio/video refers to the use of the internet for interactive audio/video applications.
   a) Interactive b) Streaming live
   c) Streaming stored d) None of the above

2) _____ is an application protocol that establishes, manages and terminates a multimedia session.
   a) RIP b) SIP
   c) DIP d) None of the above

3) _____ is not suitable for interactive multimedia traffic because it retransmits packets in case of errors.
   a) UDP b) TCP
   c) Both (a) and (b) d) None of the above

4) MIDI stands for
   a) Musical Instrument Digital Interface
   b) Musical Instrument Digital Instruction
   c) MP3 Instrument Digital Interface
   d) Musical Instrument Design Interface

5) A _____ buffer is required for real time traffic.
   a) Play back b) Recording
   c) Sorting d) None of the above

P.T.O.

6) A satellite relay station usually uses _____ band of frequencies for relaying T.V. signals.
   a) HF b) VHF c) low UHF d) SHF
7) Highest capacity in an optical disc can be obtained by using laser beam of _____ light.
   a) Green b) Red c) Blue d) Infrared
8) Encoding of colour and modulation of audio carrier use the following modulation techniques in SECAM system of France
   a) A.M. for both b) F.M. for both
   c) F.M. for colour and A.M. for audio d) A.M. for colour and F.M. for audio
9) The sync pulses are obtained by
   a) Dividing colour sub carrier b) Using a separate oscillator
   c) Using C.B. signal d) Using sweep signal
10) Weighting factor for U is
   a) 0 b) 0.493 c) 0.877 d) 1
11) Sensitivity of the eye for red colour is _____ percent.
   a) 11 b) 30 c) 50 d) 59
12) Value of sub carrier in PAL system is
   a) 3.58 MHz b) 4.43 MHz c) 5 MHz d) 7 MHz
13) Vertical blanking uses _____ μ s duration in India.
   a) 64 b) 100 c) 160 d) 1280
14) When is pre-emphasis done ?
   a) Before recording b) After recording
   c) Before detection d) After detection
15) What is the rotational speed (rpm) of the compact disc at the centre ?
   a) 200 b) 500 c) 800 d) 100
16) Hardware that creates sound from a mathematical representation
   a) Sound synthesizer b) Stampers
   c) Speaker d) Sons
17) A video consists of sequence of
   a) Frames b) Signals c) Packets d) Slots
18) _____ audio/video refers to on-demand requests for compressed audio/video files.
   a) Streaming live b) Streaming stored
   c) Interactive d) None of the above
19) _____ is a protocol for controlling the flow and quality of data.
   a) RTP b) RTCP
   c) UDP d) None of the above
20) A _____ adds signals from different sources to create a single signal.
   a) Timestamp b) Sequence number
   c) Mixer d) None of the above

Set Q

_____

SLR-VB – 193

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date : Thursday, 18-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: I)* ***All*** *questions are* ***compulsory****.*
II) Figures to ***right*** *indicate* ***full*** *marks.*

SECTION – I

2. Attempt **any four** : **(5×4=20)**
   1) Explain principle of magnetic reproduction with the help of neat sketches.
   2) Explain working of video detector stage in T.V. receiver.
   3) Compare between DVD and CD.
   4) Why G-Y signal is not transmitted along with B-Y and R-Y signals ?
   5) Explain VSB modulation.
3. Attempt **any two** : **(10×2=20)**
   1) What is frequency interleaving ? With neat sketch explain how this method is helpful for accommodating colour information also explain what is colour subcarrier frequency.
   2) Draw a block diagram of SECAM transmitter and explain function of each block.
   3) Explain in detail DTH system.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   1) Explain 4 : 2 : 2 format.
   2) What are different media types ? Explain each media type in brief.
   3) Explain the term synthesized audio.
   4) What are the basic principles of multimedia ?
   5) Explain interpersonal communication.
5. Attempt **any two** : **(10×2=20)**
   1) Explain communication modes in multimedia.
   2) What is video compression ? What are different techniques of video compression ? Explain any one in detail.
   3) Explain broadband multiservice networks in detail.

Set Q

Set Q

SLR-VB – 193

Seat No.	

Set **R**

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date : Thursday, 18-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: I)* ***All*** *questions are* ***compulsory****.*
II) Figures to ***right*** *indicate* ***full*** *marks.*
III) Q. No. ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
IV) ***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) Hardware that creates sound from a mathematical representation
   a) Sound synthesizer b) Stampers
   c) Speaker d) Sons

2) A video consists of sequence of
   a) Frames b) Signals c) Packets d) Slots

3) _____ audio/video refers to on-demand requests for compressed audio/video files.
   a) Streaming live b) Streaming stored
   c) Interactive d) None of the above

4) _____ is a protocol for controlling the flow and quality of data.
   a) RTP b) RTCP
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5) A _____ adds signals from different sources to create a single signal.
   a) Timestamp b) Sequence number
   c) Mixer d) None of the above

6) _____ audio/video refers to the use of the internet for interactive audio/video applications.
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   a) 3.58 MHz b) 4.43 MHz c) 5 MHz d) 7 MHz
18) Vertical blanking uses _____ μ s duration in India.
   a) 64 b) 100 c) 160 d) 1280
19) When is pre-emphasis done ?
   a) Before recording b) After recording
   c) Before detection d) After detection
20) What is the rotational speed (rpm) of the compact disc at the centre ?
   a) 200 b) 500 c) 800 d) 100

SLR-VB – 193

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date : Thursday, 18-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: I)* ***All*** *questions are* ***compulsory****.*
II) Figures to ***right*** *indicate* ***full*** *marks.*

SECTION – I

2. Attempt **any four** : **(5×4=20)**
   1) Explain principle of magnetic reproduction with the help of neat sketches.
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   1) What is frequency interleaving ? With neat sketch explain how this method is helpful for accommodating colour information also explain what is colour subcarrier frequency.
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SECTION – II

4. Attempt **any four** : **(5×4=20)**
   1) Explain 4 : 2 : 2 format.
   2) What are different media types ? Explain each media type in brief.
   3) Explain the term synthesized audio.
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   5) Explain interpersonal communication.

5. Attempt **any two** : **(10×2=20)**
   1) Explain communication modes in multimedia.
   2) What is video compression ? What are different techniques of video compression ? Explain any one in detail.
   3) Explain broadband multiservice networks in detail.

Set R

Set R

SLR-VB – 193

Seat No.	

Set **S**

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date : Thursday, 18-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions : *I)* ***All*** *questions are* ***compulsory****.*
II) Figures to ***right*** *indicate* ***full*** *marks.*
III) Q. No. ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
IV) ***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) Sensitivity of the eye for red colour is _____ percent.
a) 11 b) 30 c) 50 d) 59

2) Value of sub carrier in PAL system is
a) 3.58 MHz b) 4.43 MHz c) 5 MHz d) 7 MHz

3) Vertical blanking uses _____ μ s duration in India.
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4) When is pre-emphasis done ?
a) Before recording b) After recording
c) Before detection d) After detection

5) What is the rotational speed (rpm) of the compact disc at the centre ?
a) 200 b) 500 c) 800 d) 100

6) Hardware that creates sound from a mathematical representation
a) Sound synthesizer b) Stampers
c) Speaker d) Sons

7) A video consists of sequence of
a) Frames b) Signals c) Packets d) Slots

8) _____ audio/video refers to on-demand requests for compressed audio/video files.
a) Streaming live b) Streaming stored
c) Interactive d) None of the above

P.T.O.

9) _____ is a protocol for controlling the flow and quality of data.
   a) RTP b) RTCP
   c) UDP d) None of the above

10) A _____ adds signals from different sources to create a single signal.
   a) Timestamp b) Sequence number
   c) Mixer d) None of the above

11) _____ audio/video refers to the use of the internet for interactive audio/video applications.
   a) Interactive b) Streaming live
   c) Streaming stored d) None of the above

12) _____ is an application protocol that establishes, manages and terminates a multimedia session.
   a) RIP b) SIP
   c) DIP d) None of the above

13) _____ is not suitable for interactive multimedia traffic because it retransmits packets in case of errors.
   a) UDP b) TCP
   c) Both (a) and (b) d) None of the above

14) MIDI stands for
   a) Musical Instrument Digital Interface
   b) Musical Instrument Digital Instruction
   c) MP3 Instrument Digital Interface
   d) Musical Instrument Design Interface

15) A _____ buffer is required for real time traffic.
   a) Play back b) Recording
   c) Sorting d) None of the above

16) A satellite relay station usually uses _____ band of frequencies for relaying T.V. signals.
   a) HF b) VHF c) low UHF d) SHF

17) Highest capacity in an optical disc can be obtained by using laser beam of _____ light.
   a) Green b) Red c) Blue d) Infrared

18) Encoding of colour and modulation of audio carrier use the following modulation techniques in SECAM system of France
   a) A.M. for both b) F.M. for both
   c) F.M. for colour and A.M. for audio d) A.M. for colour and F.M. for audio

19) The sync pulses are obtained by
   a) Dividing colour sub carrier b) Using a separate oscillator
   c) Using C.B. signal d) Using sweep signal

20) Weighting factor for U is
   a) 0 b) 0.493 c) 0.877 d) 1

SLR-VB – 193

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date : Thursday, 18-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: I)* ***All*** *questions are* ***compulsory****.*
II) Figures to ***right*** *indicate* ***full*** *marks.*

SECTION – I

2. Attempt **any four** : **(5×4=20)**
   1) Explain principle of magnetic reproduction with the help of neat sketches.
   2) Explain working of video detector stage in T.V. receiver.
   3) Compare between DVD and CD.
   4) Why G-Y signal is not transmitted along with B-Y and R-Y signals ?
   5) Explain VSB modulation.
3. Attempt **any two** : **(10×2=20)**
   1) What is frequency interleaving ? With neat sketch explain how this method is helpful for accommodating colour information also explain what is colour subcarrier frequency.
   2) Draw a block diagram of SECAM transmitter and explain function of each block.
   3) Explain in detail DTH system.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   1) Explain 4 : 2 : 2 format.
   2) What are different media types ? Explain each media type in brief.
   3) Explain the term synthesized audio.
   4) What are the basic principles of multimedia ?
   5) Explain interpersonal communication.
5. Attempt **any two** : **(10×2=20)**
   1) Explain communication modes in multimedia.
   2) What is video compression ? What are different techniques of video compression ? Explain any one in detail.
   3) Explain broadband multiservice networks in detail.

Set S

Set S

SLR-VB – 194

Seat No.	

Set **P**

B.E. (E and TC) (Part – II) Examination, 2017
EMBEDDED SYSTEMS

Day and Date : Saturday, 20-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

***Instructions**:*
1) *Assume suitable data if **required**.*
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 alternative : **20**

1) Theoretical cycle times (fetching instruction from memory) on an ARM processor using 16 bit memory devices if the instruction size is for ARM 32 bit is given as
   a) One cycle b) Two cycle c) Four cycle d) Eight cycle

2) The data transfer between master and slave in case of LPC 2148 12c bus serial I/O controller is
   a) Unidirectional b) Bidirectional
   c) Multiple directional d) None of the above

3) Special purpose register r15 is the program counter
   a) Address of next instruction to be fetched by the processor
   b) Address of current instruction to be fetched by the processor
   c) Address of previous instruction to be fetched by the processor
   d) None of the above

4) The bit pattern of interrupt request mode in CPSR can be given as
   a) 10010 b) 10011 c) 10000 d) 10101

5) Exception priorities are following descending order
   a) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI or Undet
   b) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI and Undet
   c) Reset, FIQ, IRQ, Data, Abort, Pre Fetch Abort, SWI or Undet
   d) Not in fixed order

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) If External frequency = 12 MHz, CCLK = 48 MHz and PCLK = 12 MHz then PLLCFG and VPBDIV values are
   a) 0×23 and 0×01 b) 0×23 and 0×00
   c) 0×22 and 0×02 d) 0×22 and 0×00

P.T.O.

8) Let r5 = 5 and r7 = 8. What will be the contents of r7 after execution of instruction "MOV r7, r5, LSL #2" ?
a) 14 b) 20 c) 5 d) 8

9) _____ is the debug hardware built into the processor that allows breakpoints and watch point to be set.
a) JTAG b) Embedded ICE macrocell
c) Boundary scan d) None of the above

10) LPC 2148 has on chip _____ KB flash memory and _____ KB SRAM.
a) 30, 16 b) 128, 32 c) 512, 40 d) 256, 40

11) A thread is a _____ process.
a) Multi process b) Inter thread process
c) Light weight d) None of the above

12) What function are typically considered "operating system" ?
a) Memory management b) Process scheduling
c) All management function d) User processes

13) In regard to memory management, which is the basic unit of memory ?
a) Block b) Byte c) Page d) Sector

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 deadlock
b) Are used to do I/O
c) Are used for memory management
d) None of the 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) Inter process communication can be done through
a) Mails b) Messages c) System calls d) Trap

19) PCB =
a) Program Control Block b) Process Control Block
c) Process Communication Block d) None of the above

20) A binary semaphore
a) Has value one or zero b) Is essential to binary commuter
c) Is used only for synchronization d) Is used only for mutual exclusion

_____

SLR-VB – 194

Seat No.	

B.E. (E and TC) (Part – II) Examination, 2017
EMBEDDED SYSTEMS

Day and Date : Saturday, 20-5-2017 Marks : 80

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

Instructions: *1) Assume suitable data if **required**.*
*2) Figures to the **right** indicate **full** marks.*

SECTION – I

2. Solve **any four** questions : **(5×4=20)**

1) Explain embedded system design challenges.

2) Explain the concept of RTC in LPC2148.

3) Explain the concept of watchdog timer for LPC2148.

4) Explain with example pipeline concept used in ARM 7 processor.

5) Explain Bus architecture in ARM7.

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.

a) Power

b) Time to market

c) Safety

d) NRE cost.

3) Describe the operation with example of following ARM instructions :

a) LDR

b) MOV

c) BX

d) MLA

e) SUB.

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) Draw and explain the block diagram of digital camera.

   4) Draw interfacing diagram of DC motor with LPC2148. Write an embedded C program to rotate DC in clockwise direction.

   5) Explain Task states associated with micro C/OS II.

5. Solve **any two** questions : **(10×2=20)**

   1) What are the types of scheduling algorithm ? Explain the concepts of round time slicing scheduling method for RTOS.

   2) Explain the following kernel objects in RTOS.
      a) Mailbox
      b) Timer

   3) Interface a stepper motor with LPC2148 for the following specification :
      a) The motor is connected to port pins P0.0, P0.1, P0.2, P0.3.
      b) Rotate motor in clockwise direction.
      Draw a neat circuit diagram and an embedded C program.

SLR-VB – 194

Seat No.	

Set **Q**

B.E. (E and TC) (Part – II) Examination, 2017
EMBEDDED SYSTEMS

Day and Date : Saturday, 20-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

***Instructions**:*
1) *Assume suitable data if **required**.*
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 alternative : **20**

1) Semaphore
   a) Synchronise critical resources to prevent deadlock
   b) Are used to do I/O
   c) Are used for memory management
   d) None of the 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) Inter process communication can be done through
   a) Mails b) Messages c) System calls d) Trap

4) PCB =
   a) Program Control Block b) Process Control Block
   c) Process Communication Block d) None of the above

5) A binary semaphore
   a) Has value one or zero b) Is essential to binary commuter
   c) Is used only for synchronization d) Is used only for mutual exclusion

6) Theoretical cycle times (fetching instruction from memory) on an ARM processor using 16 bit memory devices if the instruction size is for ARM 32 bit is given as
   a) One cycle b) Two cycle c) Four cycle d) Eight cycle

7) The data transfer between master and slave in case of LPC 2148 12c bus serial I/O controller is
   a) Unidirectional b) Bidirectional
   c) Multiple directional d) None of the above

P.T.O.

8) Special purpose register r15 is the program counter
   a) Address of next instruction to be fetched by the processor
   b) Address of current instruction to be fetched by the processor
   c) Address of previous instruction to be fetched by the processor
   d) None of the above

9) The bit pattern of interrupt request mode in CPSR can be given as
   a) 10010 b) 10011 c) 10000 d) 10101

10) Exception priorities are following descending order
   a) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI or Undet
   b) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI and Undet
   c) Reset, FIQ, IRQ, Data, Abort, Pre Fetch Abort, SWI or Undet
   d) Not in fixed order

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) If External frequency = 12 MHz, CCLK = 48 MHz and PCLK = 12 MHz then PLLCFG and VPBDIV values are
   a) 0 × 23 and 0 × 01 b) 0 × 23 and 0 × 00
   c) 0 × 22 and 0 × 02 d) 0 × 22 and 0 × 00

13) Let r5 = 5 and r7 = 8. What will be the contents of r7 after execution of instruction “MOV r7, r5, LSL #2” ?
   a) 14 b) 20 c) 5 d) 8

14) _____ is the debug hardware built into the processor that allows breakpoints and watch point to be set.
   a) JTAG b) Embedded ICE macrocell
   c) Boundary scan d) None of the above

15) LPC 2148 has on chip _____ KB flash memory and _____ KB SRAM.
   a) 30, 16 b) 128, 32 c) 512, 40 d) 256, 40

16) A thread is a _____ process.
   a) Multi process b) Inter thread process
   c) Light weight d) None of the above

17) What function are typically considered “operating system” ?
   a) Memory management b) Process scheduling
   c) All management function d) User processes

18) In regard to memory management, which is the basic unit of memory ?
   a) Block b) Byte c) Page d) Sector

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-VB – 194

Seat No.	

B.E. (E and TC) (Part – II) Examination, 2017
EMBEDDED SYSTEMS

Day and Date : Saturday, 20-5-2017 Marks : 80

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

Instructions: *1) Assume suitable data if **required**.*
*2) Figures to the **right** indicate **full** marks.*

SECTION – I

2. Solve **any four** questions : **(5×4=20)**

1) Explain embedded system design challenges.

2) Explain the concept of RTC in LPC2148.

3) Explain the concept of watchdog timer for LPC2148.

4) Explain with example pipeline concept used in ARM 7 processor.

5) Explain Bus architecture in ARM7.

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.

a) Power

b) Time to market

c) Safety

d) NRE cost.

3) Describe the operation with example of following ARM instructions :

a) LDR

b) MOV

c) BX

d) MLA

e) SUB.

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) Draw and explain the block diagram of digital camera.

   4) Draw interfacing diagram of DC motor with LPC2148. Write an embedded C program to rotate DC in clockwise direction.

   5) Explain Task states associated with micro C/OS II.

5. Solve **any two** questions : **(10×2=20)**

   1) What are the types of scheduling algorithm ? Explain the concepts of round time slicing scheduling method for RTOS.

   2) Explain the following kernel objects in RTOS.
      a) Mailbox
      b) Timer

   3) Interface a stepper motor with LPC2148 for the following specification :
      a) The motor is connected to port pins P0.0, P0.1, P0.2, P0.3.
      b) Rotate motor in clockwise direction.
      Draw a neat circuit diagram and an embedded C program.

SLR-VB – 194

Seat No.	

Set **R**

B.E. (E and TC) (Part – II) Examination, 2017
EMBEDDED SYSTEMS

Day and Date : Saturday, 20-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

***Instructions**:*
1) *Assume suitable data if **required**.*
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 alternative : **20**

1) A thread is a _____ process.
   a) Multi process b) Inter thread process
   c) Light weight d) None of the above

2) What function are typically considered "operating system" ?
   a) Memory management b) Process scheduling
   c) All management function d) User processes

3) In regard to memory management, which is the basic unit of memory ?
   a) Block b) Byte c) Page d) Sector

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 deadlock
   b) Are used to do I/O
   c) Are used for memory management
   d) None of the 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) Inter process communication can be done through
   a) Mails b) Messages c) System calls d) Trap

P.T.O.

9) PCB =
   a) Program Control Block
   b) Process Control Block
   c) Process Communication Block
   d) None of the above

10) A binary semaphore
   a) Has value one or zero
   b) Is essential to binary commuter
   c) Is used only for synchronization
   d) Is used only for mutual exclusion

11) Theoretical cycle times (fetching instruction from memory) on an ARM processor using 16 bit memory devices if the instruction size is for ARM 32 bit is given as
   a) One cycle b) Two cycle c) Four cycle d) Eight cycle

12) The data transfer between master and slave in case of LPC 2148 12c bus serial I/O controller is
   a) Unidirectional
   b) Bidirectional
   c) Multiple directional
   d) None of the above

13) Special purpose register r15 is the program counter
   a) Address of next instruction to be fetched by the processor
   b) Address of current instruction to be fetched by the processor
   c) Address of previous instruction to be fetched by the processor
   d) None of the above

14) The bit pattern of interrupt request mode in CPSR can be given as
   a) 10010 b) 10011 c) 10000 d) 10101

15) Exception priorities are following descending order
   a) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI or Undet
   b) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI and Undet
   c) Reset, FIQ, IRQ, Data, Abort, Pre Fetch Abort, SWI or Undet
   d) Not in fixed order

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) If External frequency = 12 MHz, CCLK = 48 MHz and PCLK = 12 MHz then PLLCFG and VPBDIV values are
   a) 0 × 23 and 0 × 01
   b) 0 × 23 and 0 × 00
   c) 0 × 22 and 0 × 02
   d) 0 × 22 and 0 × 00

18) Let r5 = 5 and r7 = 8. What will be the contents of r7 after execution of instruction “MOV r7, r5, LSL #2” ?
   a) 14 b) 20 c) 5 d) 8

19) _____ is the debug hardware built into the processor that allows breakpoints and watch point to be set.
   a) JTAG
   b) Embedded ICE macrocell
   c) Boundary scan
   d) None of the above

20) LPC 2148 has on chip _____ KB flash memory and _____ KB SRAM.
   a) 30, 16 b) 128, 32 c) 512, 40 d) 256, 40

_____

SLR-VB – 194

Seat No.	

B.E. (E and TC) (Part – II) Examination, 2017
EMBEDDED SYSTEMS

Day and Date : Saturday, 20-5-2017 Marks : 80

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

Instructions: *1) Assume suitable data if **required**.*
*2) Figures to the **right** indicate **full** marks.*

SECTION – I

2. Solve **any four** questions : **(5×4=20)**

1) Explain embedded system design challenges.

2) Explain the concept of RTC in LPC2148.

3) Explain the concept of watchdog timer for LPC2148.

4) Explain with example pipeline concept used in ARM 7 processor.

5) Explain Bus architecture in ARM7.

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.

a) Power

b) Time to market

c) Safety

d) NRE cost.

3) Describe the operation with example of following ARM instructions :

a) LDR

b) MOV

c) BX

d) MLA

e) SUB.

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) Draw and explain the block diagram of digital camera.

   4) Draw interfacing diagram of DC motor with LPC2148. Write an embedded C program to rotate DC in clockwise direction.

   5) Explain Task states associated with micro C/OS II.

5. Solve **any two** questions : **(10×2=20)**

   1) What are the types of scheduling algorithm ? Explain the concepts of round time slicing scheduling method for RTOS.

   2) Explain the following kernel objects in RTOS.
      a) Mailbox
      b) Timer

   3) Interface a stepper motor with LPC2148 for the following specification :
      a) The motor is connected to port pins P0.0, P0.1, P0.2, P0.3.
      b) Rotate motor in clockwise direction.
      Draw a neat circuit diagram and an embedded C program.

SLR-VB – 194

Seat No.	

Set **S**

B.E. (E and TC) (Part – II) Examination, 2017
EMBEDDED SYSTEMS

Day and Date : Saturday, 20-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

***Instructions**:*
1) *Assume suitable data if **required**.*
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 alternative : **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) If External frequency = 12 MHz, CCLK = 48 MHz and PCLK = 12 MHz then PLLCFG and VPBDIV values are
   a) 0 × 23 and 0 × 01 b) 0 × 23 and 0 × 00
   c) 0 × 22 and 0 × 02 d) 0 × 22 and 0 × 00

3) Let r5 = 5 and r7 = 8. What will be the contents of r7 after execution of instruction "MOV r7, r5, LSL #2" ?
   a) 14 b) 20 c) 5 d) 8

4) _____ is the debug hardware built into the processor that allows breakpoints and watch point to be set.
   a) JTAG b) Embedded ICE macrocell
   c) Boundary scan d) None of the above

5) LPC 2148 has on chip _____ KB flash memory and _____ KB SRAM.
   a) 30, 16 b) 128, 32 c) 512, 40 d) 256, 40

6) A thread is a _____ process.
   a) Multi process b) Inter thread process
   c) Light weight d) None of the above

7) What function are typically considered "operating system" ?
   a) Memory management b) Process scheduling
   c) All management function d) User processes

8) In regard to memory management, which is the basic unit of memory ?
   a) Block b) Byte c) Page d) Sector

P.T.O.

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

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 deadlock
   b) Are used to do I/O
   c) Are used for memory management
   d) None of the 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
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13) Inter process communication can be done through
   a) Mails b) Messages c) System calls d) Trap

14) PCB =
   a) Program Control Block
   b) Process Control Block
   c) Process Communication Block
   d) None of the above

15) A binary semaphore
   a) Has value one or zero
   b) Is essential to binary commuter
   c) Is used only for synchronization
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16) Theoretical cycle times (fetching instruction from memory) on an ARM processor using 16 bit memory devices if the instruction size is for ARM 32 bit is given as
   a) One cycle b) Two cycle c) Four cycle d) Eight cycle

17) The data transfer between master and slave in case of LPC 2148 12c bus serial I/O controller is
   a) Unidirectional
   b) Bidirectional
   c) Multiple directional
   d) None of the above

18) Special purpose register r15 is the program counter
   a) Address of next instruction to be fetched by the processor
   b) Address of current instruction to be fetched by the processor
   c) Address of previous instruction to be fetched by the processor
   d) None of the above

19) The bit pattern of interrupt request mode in CPSR can be given as
   a) 10010 b) 10011 c) 10000 d) 10101

20) Exception priorities are following descending order
   a) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI or Undet
   b) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI and Undet
   c) Reset, FIQ, IRQ, Data, Abort, Pre Fetch Abort, SWI or Undet
   d) Not in fixed order

SLR-VB – 194

Seat No.	

B.E. (E and TC) (Part – II) Examination, 2017
EMBEDDED SYSTEMS

Day and Date : Saturday, 20-5-2017 Marks : 80

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

Instructions: *1) Assume suitable data if **required**.*
*2) Figures to the **right** indicate **full** marks.*

SECTION – I

2. Solve **any four** questions : **(5×4=20)**

1) Explain embedded system design challenges.

2) Explain the concept of RTC in LPC2148.

3) Explain the concept of watchdog timer for LPC2148.

4) Explain with example pipeline concept used in ARM 7 processor.

5) Explain Bus architecture in ARM7.

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.

a) Power

b) Time to market

c) Safety

d) NRE cost.

3) Describe the operation with example of following ARM instructions :

a) LDR

b) MOV

c) BX

d) MLA

e) SUB.

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) Draw and explain the block diagram of digital camera.

   4) Draw interfacing diagram of DC motor with LPC2148. Write an embedded C program to rotate DC in clockwise direction.

   5) Explain Task states associated with micro C/OS II.

5. Solve **any two** questions : **(10×2=20)**

   1) What are the types of scheduling algorithm ? Explain the concepts of round time slicing scheduling method for RTOS.

   2) Explain the following kernel objects in RTOS.
      a) Mailbox
      b) Timer

   3) Interface a stepper motor with LPC2148 for the following specification :
      a) The motor is connected to port pins P0.0, P0.1, P0.2, P0.3.
      b) Rotate motor in clockwise direction.
      Draw a neat circuit diagram and an embedded C program.

SLR-VB – 195

Seat No.	

Set **P**

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
WIRELESS SENSOR NETWORKS (Elective – II)

Day and Date : Tuesday, 23-5-2017 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) _____ is a connectivity graph where nodes are sensor nodes and edges are communication links.
   a) Sensor b) Sensor nodes
   c) Network topology d) None of the above

2) Sensor network is designed to collect information from _____ environment.
   a) Logical b) Physical c) Surgical d) None of the above

3) Challenge while designing sensor network systems and applications
   a) Limited hardware
   b) Limited support for networking
   c) Limited support for software development
   d) All of the above

4) In _____ network, routers themselves are mobile.
   a) WAN b) Mobile adhoc
   c) Mobile d) None of the above

5) _____ is treated as a source and is any entity in the network that can provide information.
   a) Sensor node b) RFID c) WAN d) None of the above

6) In WSNs, _____ mobility is viewed.
   a) Node b) Sink c) Event d) All of the above

7) _____ is an ability to keep the network alive and maintain the network performance characteristics irrespective of size of the network.
   a) Mobility b) Scalability c) Energy d) None of the above

P.T.O.

8) _____ cross layer plane is required.
   a) Power management b) Mobility management
   c) Task management d) All of the above

9) _____ is the main concern in designing time synchronization protocols.
   a) Energy efficiency b) Power consumption
   c) Both a) and b) d) None of the above

10) Performance of time synchronization protocol is closely related with
   a) Network topology b) Power
   c) Frames d) None of the above

11) _____ based protocol do not divide channel into sub-channels or pre-allocate the channel for each node to use.
   a) Contention b) Schedule c) RFID d) None of the above

12) LEACH is an example of _____ based protocols.
   a) Contention b) Schedule c) RFID d) None of the above

13) Design of wake up concept must take into account _____ layer.
   a) Physical b) MAC c) Both a) and b) d) None of the above

14) Which of the following statement about Radio Frequency Identification is not true ?
   a) RFID tags transmit data about a product when scanned
   b) “Passive” RFID tags do not require a battery to transmit data
   c) RFID tags can be scanned by just being near the scanning device
   d) RFID codes are not subject to viruses

15) _____ communication is a communication between tags and readers.
   a) Backscatter b) Analog c) Digital d) None of the above

16) _____ is the ability of a system to function properly in an environment where other electromagnetic devices are used and not itself be a source of EMI.
   a) EMC b) Selection c) Both a) and b) d) None of the above

17) _____ is the interference caused when radio waves of one device distorts the waves of another.
   a) EMI b) EMC c) Both a) and b) d) None of the above

18) _____ tags have a no battery.
   a) Active RFID b) Passive RFID c) Both a) and b) d) None of the above

19) _____ is the application of RFID.
   a) Identification and data capture b) Health-care
   c) Massive incidents d) All of the above

20) RFID physical layer design automation allow _____ of new RFID specifications and standards.
   a) Design b) Optimization c) Verification d) All of the above

_____

SLR-VB – 195

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
WIRELESS SENSOR NETWORKS (Elective – II)

Day and Date : Tuesday, 23-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

2. Solve **any four** : **20**
   a) What are the various applications of Mobile Adhoc Networks ?
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   c) Explain Operating Systems and Execution Environments.
   d) Write a note on clustering.
   e) Explain the optimization goals of network architecture.

3. Solve **any two** of the following : **20**
   a) Explain localization and positioning.
   b) Write a note on energy consumption of sensor nodes and gateway concept.
   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 wake-up in MAC protocol.
   b) Write a note on Antenna directivity and gain.
   c) Explain the use of RFID in massive incidents.
   d) What are the EMC requirements for Electronic System ?
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5. Solve **any two** of the following : **20**
   a) Explain IEEE 802.15.4 MAC protocol.
   b) Explain RFID Controller Design Automation.
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Set P

SLR-VB – 195

Seat No.	

Set **Q**

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
WIRELESS SENSOR NETWORKS (Elective – II)

Day and Date : Tuesday, 23-5-2017 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. Choose the correct answer : **20**

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c) Limited support for software development
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P.T.O.

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   a) Sensor node b) RFID c) WAN d) None of the above

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13) _____ cross layer plane is required.
   a) Power management b) Mobility management
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14) _____ is the main concern in designing time synchronization protocols.
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_____

SLR-VB – 195

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
WIRELESS SENSOR NETWORKS (Elective – II)

Day and Date : Tuesday, 23-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

2. Solve **any four** : **20**
   a) What are the various applications of Mobile Adhoc Networks ?
   b) Explain the various hardware components of Single Node architecture.
   c) Explain Operating Systems and Execution Environments.
   d) Write a note on clustering.
   e) Explain the optimization goals of network architecture.

3. Solve **any two** of the following : **20**
   a) Explain localization and positioning.
   b) Write a note on energy consumption of sensor nodes and gateway concept.
   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 wake-up in MAC protocol.
   b) Write a note on Antenna directivity and gain.
   c) Explain the use of RFID in massive incidents.
   d) What are the EMC requirements for Electronic System ?
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5. Solve **any two** of the following : **20**
   a) Explain IEEE 802.15.4 MAC protocol.
   b) Explain RFID Controller Design Automation.
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Set Q

Set Q

SLR-VB – 195

Seat No.	

Set R

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
WIRELESS SENSOR NETWORKS (Elective – II)

Day and Date : Tuesday, 23-5-2017 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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P.T.O.

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_____

SLR-VB – 195

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
WIRELESS SENSOR NETWORKS (Elective – II)

Day and Date : Tuesday, 23-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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Set R

SLR-VB – 195

Seat No.	

Set **S**

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
WIRELESS SENSOR NETWORKS (Elective – II)

Day and Date : Tuesday, 23-5-2017 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) In WSNs, _____ mobility is viewed.
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P.T.O.

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_____

SLR-VB – 195

Seat No.	

B.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2017
WIRELESS SENSOR NETWORKS (Elective – II)

Day and Date : Tuesday, 23-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

2. Solve **any four** : **20**
   a) What are the various applications of Mobile Adhoc Networks ?
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5. Solve **any two** of the following : **20**
   a) Explain IEEE 802.15.4 MAC protocol.
   b) Explain RFID Controller Design Automation.
   c) Explain the application of RFID in identification and data capture.

Set S

SLR-VB – 196

Seat No.	

Set **P**

B.E. (E&TC) (Part – II) Examination, 2017
PATTERN RECOGNITION (Elective – II)

Day and Date : Tuesday, 23-5-2017 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**

SECTION – I

1) What are the problems of dimensionality ?
   a) Accuracy b) Dimension c) Over fitting d) All of the above

2) 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

3) 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

4) 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) $p(x)$

5) 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

6) The method in which parameters are random variables having some known prior distribution is called
   a) Maximum-likelihood b) Bayesian
   c) Both a and b d) None of these

7) The probability of emitting a particular visible state is denoted as
   a) a_{jk} b) b_{jk} c) either a or b d) none of these

8) The likelihood is given as
   a) $P(x|w_j)$ b) $P(w_j|x)$ c) $P(x)$ d) None of these

P.T.O.

9) To minimize the probability of error, the posterior probability be
   a) Minimum b) Zero c) Maximum d) One

10) A minimum-distance classifier uses
   a) Euclidean distance b) Mahalanobis distance
   c) Absolute distance d) All of these

SECTION – II

11) The representation of hierarchical clustering in a tree form is called
   a) Graph b) Binary tree c) Dendrogram d) None of these

12) The location of decision surface represented by linear discriminant function is given by
   a) Weight vector (w) b) Threshold vector (w0)
   c) Initial vector (w1) d) All of these

13) Hierarchical clustering procedure belong to
   a) Supervised method b) Unsupervised method
   c) Both a and b d) None of the above

14) Which of the following criterion function measures the clustering quality ?
   a) Perceptron criterion function b) Sum of squared-error function
   c) Linear discriminant function d) None of these

15) A cell labeled by the same category of the training points is called
   a) Symmetry b) Reflexivity
   c) Voronoi tessellation d) None of the above

16) The perceptron and relaxation procedures use a criterion function that _____
   a) Minimizes it b) Maximizes it
   c) Equal to zero d) Either a or b

17) Procedures that use unlabeled samples are said to be
   a) Supervised b) Unsupervised
   c) Discriminant d) None of the above

18) The density estimation in which the volume Vn is grown until it encloses $K_n = \sqrt{n}$ neighbors is called
   a) Parzen-window method b) Baysian estimation
   c) Kn-nearest-neighbor d) All of these

19) Any property of the sensed pattern due not to the true underlying mode but instead to the randomness in the world or the sensors is known as _____
   a) pattern b) noise c) image d) feature

20) Nonnegativity property of distance metric is given as
   a) $D(a, b) + D(b, c) \geq D(a, c)$ b) $D(a, b) \geq 0$
   c) $D(a, b) = D(b, a)$ d) None of these

_____

SLR-VB – 196

Seat No.	

B.E. (E&TC) (Part – II) Examination, 2017
PATTERN RECOGNITION (Elective – II)

Day and Date : Tuesday, 23-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four** : **(4×6=24)**
   a) Find the constant C so that the function
      $f(x, y) = C(x - 1)$, $1 < x < 4$
      $= 0$, otherwise
   b) Explain mean and variance of normal density function.
   c) Explain general principle estimation of maximum likelihood estimation.
   d) Explain supervised learning.
   e) State and prove Baye's theorem.

3. Attempt **any two** : **(2×8=16)**
   a) Explain Hidden Markov Models (HMM) and give HMM backward algorithm.
   b) State and explain issues in design of feature extractor.
   c) Derive an expression for discriminate function when each feature has same variance.

SECTION – II

4. Attempt **any four** : **(4×6=24)**
   a) Explain determinant criteria for clustering.
   b) Explain k-means clustering algorithm.
   c) Explain Parzen window estimation. Illustrate with diagrams.
   d) Write a note on Neural Networks.
   e) What is Isodata algorithm ?

5. Attempt **any two** : **(2×8=16)**
   a) Briefly explain single linkage, complete linkage and average linkage.
   b) Explain metrics of nearest neighbour classification.
   c) Which is the fuzzy optimization technique in recognition ? Explain in brief.

Set P

Set P

SLR-VB – 196

Seat No.	

Set **Q**

B.E. (E&TC) (Part – II) Examination, 2017
PATTERN RECOGNITION (Elective – II)

Day and Date : Tuesday, 23-5-2017 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**

SECTION – I

1) 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

2) The method in which parameters are random variables having some known prior distribution is called
   a) Maximum-likelihood b) Bayesian
   c) Both a and b d) None of these

3) The probability of emitting a particular visible state is denoted as
   a) a_{jk} b) b_{jk} c) either a or b d) none of these

4) The likelihood is given as
   a) $P(x|w_j)$ b) $P(w_j|x)$ c) $P(x)$ d) None of these

5) To minimize the probability of error, the posterior probability be
   a) Minimum b) Zero c) Maximum d) One

6) A minimum-distance classifier uses
   a) Euclidean distance b) Mahalanobis distance
   c) Absolute distance d) All of these

7) What are the problems of dimensionality ?
   a) Accuracy b) Dimension c) Over fitting d) All of the above

8) 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.

9) 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

10) 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)

SECTION – II

11) A cell labeled by the same category of the training points is called
   a) Symmetry
   b) Reflexivity
   c) Voronoi tessellation
   d) None of the above

12) The perceptron and relaxation procedures use a criterion function that _____
   a) Minimizes it
   b) Maximizes it
   c) Equal to zero
   d) Either a or b

13) Procedures that use unlabeled samples are said to be
   a) Supervised
   b) Unsupervised
   c) Discriminant
   d) None of the above

14) The density estimation in which the volume Vn is grown until it encloses $Kn = \sqrt{n}$ neighbors is called
   a) Parzen-window method
   b) Baysian estimation
   c) Kn-nearest-neighbor
   d) All of these

15) Any property of the sensed pattern due not to the true underlying mode but instead to the randomness in the world or the sensors is known as _____
   a) pattern b) noise c) image d) feature

16) Nonnegativity property of distance metric is given as
   a) $D(a, b) + D(b, c) \geq D(a, c)$
   b) $D(a, b) \geq 0$
   c) $D(a, b) = D(b, a)$
   d) None of these

17) The representation of hierarchical clustering in a tree form is called
   a) Graph b) Binary tree c) Dendrogram d) None of these

18) The location of decision surface represented by linear discriminant function is given by
   a) Weight vector (w)
   b) Threshold vector (w0)
   c) Initial vector (w1)
   d) All of these

19) Hierarchical clustering procedure belong to
   a) Supervised method
   b) Unsupervised method
   c) Both a and b
   d) None of the above

20) Which of the following criterion function measures the clustering quality ?
   a) Perceptron criterion function
   b) Sum of squared-error function
   c) Linear discriminant function
   d) None of these

_____

SLR-VB – 196

Seat No.	

B.E. (E&TC) (Part – II) Examination, 2017
PATTERN RECOGNITION (Elective – II)

Day and Date : Tuesday, 23-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four** : **(4×6=24)**
   a) Find the constant C so that the function
      $f(x, y) = C(x - 1)$, $1 < x < 4$
      $= 0$, otherwise
   b) Explain mean and variance of normal density function.
   c) Explain general principle estimation of maximum likelihood estimation.
   d) Explain supervised learning.
   e) State and prove Baye's theorem.

3. Attempt **any two** : **(2×8=16)**
   a) Explain Hidden Markov Models (HMM) and give HMM backward algorithm.
   b) State and explain issues in design of feature extractor.
   c) Derive an expression for discriminate function when each feature has same variance.

SECTION – II

4. Attempt **any four** : **(4×6=24)**
   a) Explain determinant criteria for clustering.
   b) Explain k-means clustering algorithm.
   c) Explain Parzen window estimation. Illustrate with diagrams.
   d) Write a note on Neural Networks.
   e) What is Isodata algorithm ?

5. Attempt **any two** : **(2×8=16)**
   a) Briefly explain single linkage, complete linkage and average linkage.
   b) Explain metrics of nearest neighbour classification.
   c) Which is the fuzzy optimization technique in recognition ? Explain in brief.

Set Q

Set Q

SLR-VB – 196

Seat No.	

Set **R**

B.E. (E&TC) (Part – II) Examination, 2017
PATTERN RECOGNITION (Elective – II)

Day and Date : Tuesday, 23-5-2017 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**

SECTION – I

1) The method in which parameters are random variables having some known prior distribution is called
   a) Maximum-likelihood b) Bayesian
   c) Both a and b d) None of these

2) The probability of emitting a particular visible state is denoted as
   a) a_{jk} b) b_{jk} c) either a or b d) none of these

3) The likelihood is given as
   a) $P(x|w_j)$ b) $P(w_j|x)$ c) P(x) d) None of these

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5) A minimum-distance classifier uses
   a) Euclidean distance b) Mahalanobis distance
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6) What are the problems of dimensionality ?
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7) A generalized linear discriminant function is given by
   a) g(x) = ay b) $g(x) = a^t y$ c) $g(x) = ay^t$ d) none of the above

8) 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)

P.T.O.

10) The density estimation in which the volume V_n is shrinked according to function $V_n = \frac{1}{\sqrt{n}}$ is called
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SECTION – II

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   b) Maximizes it
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   d) Either a or b

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   a) Supervised
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   a) Weight vector (w)
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19) Which of the following criterion function measures the clustering quality ?
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   a) Symmetry
   b) Reflexivity
   c) Voronoi tessellation
   d) None of the above

_____

SLR-VB – 196

Seat No.	

B.E. (E&TC) (Part – II) Examination, 2017
PATTERN RECOGNITION (Elective – II)

Day and Date : Tuesday, 23-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four** : **(4×6=24)**
   a) Find the constant C so that the function
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      $= 0$, otherwise
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   c) Explain general principle estimation of maximum likelihood estimation.
   d) Explain supervised learning.
   e) State and prove Baye's theorem.

3. Attempt **any two** : **(2×8=16)**
   a) Explain Hidden Markov Models (HMM) and give HMM backward algorithm.
   b) State and explain issues in design of feature extractor.
   c) Derive an expression for discriminate function when each feature has same variance.

SECTION – II

4. Attempt **any four** : **(4×6=24)**
   a) Explain determinant criteria for clustering.
   b) Explain k-means clustering algorithm.
   c) Explain Parzen window estimation. Illustrate with diagrams.
   d) Write a note on Neural Networks.
   e) What is Isodata algorithm ?

5. Attempt **any two** : **(2×8=16)**
   a) Briefly explain single linkage, complete linkage and average linkage.
   b) Explain metrics of nearest neighbour classification.
   c) Which is the fuzzy optimization technique in recognition ? Explain in brief.

Set R

Set R

SLR-VB – 196

Seat No.	

Set **S**

B.E. (E&TC) (Part – II) Examination, 2017
PATTERN RECOGNITION (Elective – II)

Day and Date : Tuesday, 23-5-2017 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**

SECTION – I

1) The probability of emitting a particular visible state is denoted as
   a) a_{jk} b) b_{jk} c) either a or b d) none of these
2) The likelihood is given as
   a) $P(x|w_j)$ b) $P(w_j|x)$ c) P(x) d) None of these
3) To minimize the probability of error, the posterior probability be
   a) Minimum b) Zero c) Maximum d) One
4) A minimum-distance classifier uses
   a) Euclidean distance b) Mahalanobis distance
   c) Absolute distance d) All of these
5) What are the problems of dimensionality ?
   a) Accuracy b) Dimension c) Over fitting d) All of the above
6) 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
7) 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
8) 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)
9) The density estimation in which the volume V_n is shrinked according to function $V_n = \frac{1}{\sqrt{n}}$ is called
   a) Kn-nearest neighbor b) Bayesian estimation
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P.T.O.

10) The method in which parameters are random variables having some known prior distribution is called
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c) Both a and b d) None of these

SECTION – II

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a) Supervised b) Unsupervised
c) Discriminant d) None of the above

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19) A cell labeled by the same category of the training points is called
a) Symmetry b) Reflexivity
c) Voronoi tessellation d) None of the above

20) The perceptron and relaxation procedures use a criterion function that _____
a) Minimizes it b) Maximizes it
c) Equal to zero d) Either a or b

_____

SLR-VB – 196

Seat No.	

B.E. (E&TC) (Part – II) Examination, 2017
PATTERN RECOGNITION (Elective – II)

Day and Date : Tuesday, 23-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any four** : **(4×6=24)**
   a) Find the constant C so that the function
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      $= 0$, otherwise
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   c) Explain general principle estimation of maximum likelihood estimation.
   d) Explain supervised learning.
   e) State and prove Baye's theorem.

3. Attempt **any two** : **(2×8=16)**
   a) Explain Hidden Markov Models (HMM) and give HMM backward algorithm.
   b) State and explain issues in design of feature extractor.
   c) Derive an expression for discriminate function when each feature has same variance.

SECTION – II

4. Attempt **any four** : **(4×6=24)**
   a) Explain determinant criteria for clustering.
   b) Explain k-means clustering algorithm.
   c) Explain Parzen window estimation. Illustrate with diagrams.
   d) Write a note on Neural Networks.
   e) What is Isodata algorithm ?

5. Attempt **any two** : **(2×8=16)**
   a) Briefly explain single linkage, complete linkage and average linkage.
   b) Explain metrics of nearest neighbour classification.
   c) Which is the fuzzy optimization technique in recognition ? Explain in brief.

Set S

Set S

SLR-VB – 197

Seat No.	

Set P

B.E. (Electronics and Telecommunication) (Part – II) Examination, 2017
DSP PROCESSORS AND APPLICATION (Elective – II)

Day and Date : Tuesday, 23-5-2017 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 answers : **20**

1) The AR ALU (ARAU) performs _____ arithmetic on _____ numbers.
a) Unsigned, 16 b) Signed, 16 c) Signed, 32 d) Unsigned, 32

2) The ARAU stands for
a) Ancillary Register ALU b) Auxiliary Register ALU
c) Anchor Register ALU d) None

3) The TMS320C6X is _____ processor.
a) Floating point b) Fixed point
c) Floating/fixed point d) All above

4) The no. of 32 bit general purpose registers in C6X is _____
a) 4 b) 8 c) 16 d) 32

5) 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

6) 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.

7) The C6X pipeline requires _____ phases in fetch stage.
a) 2 b) 4 c) 5 d) 6

8) The C6X pipeline requires _____ phases in decode stage.
a) 2 b) 24 c) 5 d) 6

9) In TMS320C6X internal memory is organized as _____
a) Separate program and data b) Not separate program and data
c) Only program d) Only data

10) The L2 cache of _____ K word is shared by both program and data memory space.
a) 4 b) 8 c) 16 d) 64

11) DSP Processors can be used to implement _____ application.
a) Image Processing b) Video Processing
c) Signal Processing d) All above

12) The result of operation performed in central ALU are stored into _____
a) ACC b) ACCB c) TREG0 d) PREG

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) L1P and L1D caches are each of _____ k-word length.
a) 8 b) 16 c) 4 d) 64

15) The multipliers multiply _____ × _____ numbers.
a) 16, 16 b) 17, 17 c) 24, 24 d) 32, 32

16) The C5X has _____ registers mapped into page0 of the data memory space.
a) 16 b) 56 c) 96 d) 46

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) C6X has _____ multipliers.
a) 2 b) 6 c) 4 d) 1

19) The register used for which holds the address of the current data memory page is _____
a) DP b) ARP c) ARB d) None

20) The no. of 32 bit general purpose registers in C6X is _____
a) 4 b) 8 c) 16 d) 32

_____

SLR-VB – 197

Seat No.	

B.E. (Electronics and Telecommunication) (Part – II) Examination, 2017
DSP PROCESSORS AND APPLICATION (Elective – II)

Day and Date : Tuesday, 23-5-2017 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) What are different buses of TMS 320C54X and their functions ?
   2) List the functional units in CALU of 5X and explain.
   3) Enlist the features of TMS 320C54X.
   4) Explain about fixed point DSP processors.
   5) Compare between fixed point and floating point DSPs.

3. Attempt **any two** : **(10×2=20)**
   1) Explain bus structure of 5X series DSP in detail.
   2) Draw the architecture of 5X and explain in detail.
   3) Draw the architecture of ADSP-21061 and explain in detail.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   1) Explain how the C6X architecture differs from C54X.
   2) Explain the operation of L2 cache controller.
   3) Explain FIR implementation using TMS 320C6X DSP processor.
   4) Explain internal memory organization in 6X DSPs.
   5) Explain addressing modes in 6X DSPs.

5. Attempt **any two** : **(10×2=20)**
   1) Explain the C6X pipeline operation in detail.
   2) Discuss the implementation of FFT algorithms using TMS 320C6X DSP processor.
   3) Draw and explain TMS320C6X CPU data paths.

Set P

Set P

SLR-VB – 197

Seat No.	

Set Q

B.E. (Electronics and Telecommunication) (Part – II) Examination, 2017
DSP PROCESSORS AND APPLICATION (Elective – II)

Day and Date : Tuesday, 23-5-2017 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 answers : **20**

1) The C5X has _____ registers mapped into page0 of the data memory space.
a) 16 b) 56 c) 96 d) 46

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) C6X has _____ multipliers.
a) 2 b) 6 c) 4 d) 1

4) The register used for which holds the address of the current data memory page is _____
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a) Unsigned, 16 b) Signed, 16 c) Signed, 32 d) Unsigned, 32

7) The ARAU stands for
a) Ancillary Register ALU b) Auxiliary Register ALU
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P.T.O.

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SLR-VB – 197

Seat No.	

B.E. (Electronics and Telecommunication) (Part – II) Examination, 2017
DSP PROCESSORS AND APPLICATION (Elective – II)

Day and Date : Tuesday, 23-5-2017 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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SECTION – II

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Set Q

Set Q

SLR-VB – 197

Seat No.	

Set R

B.E. (Electronics and Telecommunication) (Part – II) Examination, 2017
DSP PROCESSORS AND APPLICATION (Elective – II)

Day and Date : Tuesday, 23-5-2017 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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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 answers : **20**

1) DSP Processors can be used to implement _____ application.
   a) Image Processing b) Video Processing
   c) Signal Processing d) All above

2) The result of operation performed in central ALU are stored into _____
   a) ACC b) ACCB c) TREG0 d) PREG

3) 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

4) L1P and L1D caches are each of _____ k-word length.
   a) 8 b) 16 c) 4 d) 64

5) The multipliers multiply _____ × _____ numbers.
   a) 16, 16 b) 17, 17 c) 24, 24 d) 32, 32

6) The C5X has _____ registers mapped into page0 of the data memory space.
   a) 16 b) 56 c) 96 d) 46

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) C6X has _____ multipliers.
a) 2 b) 6 c) 4 d) 1

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 no. of 32 bit general purpose registers in C6X is _____
a) 4 b) 8 c) 16 d) 32

11) The AR ALU (ARAU) performs _____ arithmetic on _____ numbers.
a) Unsigned, 16 b) Signed, 16 c) Signed, 32 d) Unsigned, 32

12) The ARAU stands for
a) Ancillary Register ALU b) Auxiliary Register ALU
c) Anchor Register ALU d) None

13) The TMS320C6X is _____ processor.
a) Floating point b) Fixed point
c) Floating/fixed point d) All above

14) The no. of 32 bit general purpose registers in C6X is _____
a) 4 b) 8 c) 16 d) 32

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) 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

17) The C6X pipeline requires _____ phases in fetch stage.
a) 2 b) 4 c) 5 d) 6

18) The C6X pipeline requires _____ phases in decode stage.
a) 2 b) 24 c) 5 d) 6

19) In TMS320C6X internal memory is organized as _____
a) Separate program and data b) Not separate program and data
c) Only program d) Only data

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-VB – 197

Seat No.	

B.E. (Electronics and Telecommunication) (Part – II) Examination, 2017
DSP PROCESSORS AND APPLICATION (Elective – II)

Day and Date : Tuesday, 23-5-2017 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) What are different buses of TMS 320C54X and their functions ?
   2) List the functional units in CALU of 5X and explain.
   3) Enlist the features of TMS 320C54X.
   4) Explain about fixed point DSP processors.
   5) Compare between fixed point and floating point DSPs.

3. Attempt **any two** : **(10×2=20)**
   1) Explain bus structure of 5X series DSP in detail.
   2) Draw the architecture of 5X and explain in detail.
   3) Draw the architecture of ADSP-21061 and explain in detail.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   1) Explain how the C6X architecture differs from C54X.
   2) Explain the operation of L2 cache controller.
   3) Explain FIR implementation using TMS 320C6X DSP processor.
   4) Explain internal memory organization in 6X DSPs.
   5) Explain addressing modes in 6X DSPs.

5. Attempt **any two** : **(10×2=20)**
   1) Explain the C6X pipeline operation in detail.
   2) Discuss the implementation of FFT algorithms using TMS 320C6X DSP processor.
   3) Draw and explain TMS320C6X CPU data paths.

Set R

Set R

SLR-VB – 197

Seat No.	

Set S

B.E. (Electronics and Telecommunication) (Part – II) Examination, 2017
DSP PROCESSORS AND APPLICATION (Elective – II)

Day and Date : Tuesday, 23-5-2017 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 answers : **20**

1) 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

2) The C6X pipeline requires _____ phases in fetch stage.
   a) 2 b) 4 c) 5 d) 6

3) The C6X pipeline requires _____ phases in decode stage.
   a) 2 b) 24 c) 5 d) 6

4) In TMS320C6X internal memory is organized as _____
   a) Separate program and data b) Not separate program and data
   c) Only program d) Only data

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) DSP Processors can be used to implement _____ application.
   a) Image Processing b) Video Processing
   c) Signal Processing d) All above

7) The result of operation performed in central ALU are stored into _____
   a) ACC b) ACCB c) TREG0 d) PREG

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

P.T.O.

9) L1P and L1D caches are each of _____ k-word length.
a) 8 b) 16 c) 4 d) 64

10) The multipliers multiply _____ × _____ numbers.
a) 16, 16 b) 17, 17 c) 24, 24 d) 32, 32

11) The C5X has _____ registers mapped into page0 of the data memory space.
a) 16 b) 56 c) 96 d) 46

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) C6X has _____ multipliers.
a) 2 b) 6 c) 4 d) 1

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 no. of 32 bit general purpose registers in C6X is _____
a) 4 b) 8 c) 16 d) 32

16) The AR ALU (ARAU) performs _____ arithmetic on _____ numbers.
a) Unsigned, 16 b) Signed, 16 c) Signed, 32 d) Unsigned, 32

17) The ARAU stands for
a) Ancillary Register ALU b) Auxiliary Register ALU
c) Anchor Register ALU d) None

18) The TMS320C6X is _____ processor.
a) Floating point b) Fixed point
c) Floating/fixed point d) All above

19) The no. of 32 bit general purpose registers in C6X is _____
a) 4 b) 8 c) 16 d) 32

20) 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

_____

SLR-VB – 197

Seat No.	

B.E. (Electronics and Telecommunication) (Part – II) Examination, 2017
DSP PROCESSORS AND APPLICATION (Elective – II)

Day and Date : Tuesday, 23-5-2017 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) What are different buses of TMS 320C54X and their functions ?
   2) List the functional units in CALU of 5X and explain.
   3) Enlist the features of TMS 320C54X.
   4) Explain about fixed point DSP processors.
   5) Compare between fixed point and floating point DSPs.

3. Attempt **any two** : **(10×2=20)**
   1) Explain bus structure of 5X series DSP in detail.
   2) Draw the architecture of 5X and explain in detail.
   3) Draw the architecture of ADSP-21061 and explain in detail.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   1) Explain how the C6X architecture differs from C54X.
   2) Explain the operation of L2 cache controller.
   3) Explain FIR implementation using TMS 320C6X DSP processor.
   4) Explain internal memory organization in 6X DSPs.
   5) Explain addressing modes in 6X DSPs.

5. Attempt **any two** : **(10×2=20)**
   1) Explain the C6X pipeline operation in detail.
   2) Discuss the implementation of FFT algorithms using TMS 320C6X DSP processor.
   3) Draw and explain TMS320C6X CPU data paths.

Set S

Set S

SLR-VB – 198

Seat No.	

Set **P**

B.E. (E&TC) (Part – II) Examination, 2017
FUZZY LOGIC (Old)

Day and Date : Thursday, 25-5-2017 Max. Marks : 80
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 answers : **(1×20=20)**

1) A/B is defined as _____
   a) The collection of all elements in the universe that reside in A and don't reside in B
   b) The collection of all elements in the universe that reside in B and don't reside in A
   c) Null set
   d) None

2) A U A' = X is called as _____
   a) Axiom of excluded middle b) Axiom of Contradiction
   c) Union operation d) None

3) Fuzzy system are _____
   a) Control system b) Rule based system
   c) Both a) and b) d) None

4) Implication connective is equivalent to Fuzzy relation R as _____
   a) $(A \times B) \cup (\overline{A} \times Y)$ b) $(A \times B) \cup (A \times Y)$
   c) $(A \times B) \cap (\overline{A} \times Y)$ d) None

5) Centroid method is also known as _____
   a) Centre of area b) Centre of gravity
   c) Both a) and b) d) None

6) The support of a fuzzy set A within a universal set X is the crisp set that contain all elements of X that have _____
   a) Infinite membership grade in A
   b) Non zero membership grade in A
   c) Zero membership grade in A
   d) None

7) The induction is performed by _____
   a) Standard value b) Mean value calculations
   c) Entropy minimizations d) None

8) The optimum partition, U*, to be the partition that produces _____
   a) Max value of J function b) Min value of J function
   c) Value of J function d) None

P.T.O.

9) Family of Fuzzy partition matrices, M_{FC}, for the classification involving C classes and n data points _____

a) $\left\{ U \mid \mu ik \in [0,1]; \Sigma_{i=1}^{C} \mu ik = 1 \; ; \; 0 < \Sigma_{k=1}^{C} < n; \right\}$

b) $\left\{ U \mid \mu ik \in [0,1] \; ; \; \Sigma_{i=1}^{C} \mu ik = 1 \; ; \; 0 < \Sigma_{i=1}^{C} < n; \right\}$

c) $\left\{ U \mid \mu ik \in [0,1] \; ; \Sigma_{i=1}^{n} \mu ik = 1 \; ; \; 0 < \Sigma_{k=1}^{C} < n; \right\}$

d) None

10) Cognitive maps graphically describes a system in terms of _____
a) Concept variables
b) Concept variables and causal relations
c) Causal relations
d) None

11) Fuzzy relation R based on, IF A, THEN B as _____
a) $B \rightarrow A$ b) $A \rightarrow B$ c) $A \rightarrow \bar{B}$ d) None

12) In simple fuzzy logic controllers, partition the universe of discourse by each variable into a number of fuzzy subsets, assigning each a _____
a) Membership function b) IF-THEN rules
c) Linguistic labels d) None

13) The physician's medical knowledge is represented as a fuzzy relation between _____
a) Disease and patient b) Symptoms and patient
c) Both a) and b) d) None of these

14) Chromosomes x and y, to which crossover operation is applied, is called
a) Mutation b) Mates c) Fitness d) None

15) For Nontransitive ranking, we introduce a special notion of _____
a) Transitive b) Relativity c) Ordinal ranking d) None

16) Interval valued fuzzy sets can further be generalized as _____
a) Type II fuzzy sets b) Ordinary fuzzy sets
c) Fuzzy power sets d) None

17) Rank ordering ambiguity demonstrated for both fuzzy and _____ variables.
a) Static b) Constant c) Random d) None

18) In fuzzy expert systems, the knowledge is usually represented by the set of
a) Fuzzy production rules b) Fuzzy nos.
c) Fuzzy coefficients d) None

19) The model proposes two types of relation exist between symptoms and disease are _____
a) Occurrence relation b) Comfirmability relation
c) Both a) and b) d) None of these

20) Fuzzy regression analysis uses _____ to represent the coefficient.
a) Fuzzy number b) Fuzzy coefficient
c) Fuzzy function d) None

_____

SLR-VB – 198

Seat No.	

B.E. (E&TC) (Part – II) Examination, 2017
FUZZY LOGIC (Old)

Day and Date : Thursday, 25-5-2017 Marks : 60
Time : 10.00 a.m. to 1.00 p.m.

SECTION – I

2. Answer **any four** : **(4×5=20)**

a) Perform the following operations on intervals :
i) [3, 3] – [2, 5] ii) [3, 2] × [5, 3].

b) Consider the following two discrete fuzzy sets, which are defined on universe X = {–5, 5}: Construct relation for the rule IF A THEN B

$$A = \text{zero} = \left\{ \frac{1}{-2} + \frac{0.75}{-1} + \frac{0.25}{0} + \frac{0.55}{1} + \frac{0}{2} \right\} \quad B = \text{positive medium} = \left\{ \frac{1}{0} + \frac{0.5}{1} + \frac{0.56}{2} + \frac{0.5}{3} + \frac{0}{4} \right\}.$$

c) Explain methods of membership value assignment – intuition and inference.

d) Explain extension principle in fuzzy arithmetic.

e) Methane biofilters can be used to oxidize methane using biological activities. It has become necessary to compare performance of two test columns, A and B. The methane outflow level at the surface in nondimensional units of X = {50, 100, 150, 200], was detected and is tabulated below against the respective methane inflow into each test column. The following fuzzy sets represent the test columns.

$\underset{\sim}{A} = \left\{ \frac{0.15}{50} + \frac{0.25}{100} + \frac{0.5}{150} + \frac{0.7}{200} \right\}$ $\underset{\sim}{B} = \left\{ \frac{0.2}{50} + \frac{0.3}{100} + \frac{0.6}{150} + \frac{0.65}{200} \right\}$. Calculate the union, intersection and the difference for the test columns.

f) Using your own intuition and your own definitions of the universe of discourse, plot fuzzy membership functions for the following variables :
Age of people
i) Very young ii) Young iii) Middle-aged iv) Old v) Very old.

3. Answer the following : **(1×10=10)**

a) Two fuzzy sets and both defined on X, are as follows :

$\mu(x_i)$	x_1	x_2	x_3	x_4	x_5	x_6
$\underset{\sim}{A}$	0.1	0.6	0.8	0.9	0.7	0.1
$\underset{\sim}{B}$	0.9	0.7	0.5	0.2	0.1	0

Express the following λ-cut sets using Zadeh's notation.

a) $(\overline{\underset{\sim}{A}})_{0.7}$ b) $(\underset{\sim}{B})_{0.4}$ c) $(\underset{\sim}{A} \cup \underset{\sim}{B})_{0.7}$ d) $(\underset{\sim}{A} \cap \underset{\sim}{B})_{0.6}$

b) In fuzzy automata, generate fuzzy input and output states under following conditions.

Output Relation R = $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0.5 & 1 & 0.7 \end{bmatrix}$ and state transition relation

$$S = \left[\begin{bmatrix} 0 & 0.3 & 0.9 & 1 \\ 0.5 & 1 & 0 & 0.2 \\ 0.6 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0.2 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0.4 & 0 & 0.6 \end{bmatrix} \right].$$

With initial state $C^1 = [1 \ 0.8 \ 0.6 \ 0.4]$
Inputs A1 = [0.4 0] A2 = [1 0] A3 = [1 0.7]

OR

b) What is defuzzification ? Explain methods of defuzzification.

SECTION – II

4. Answer the following : **(1×10=10)**

a) An aircraft control system is a totally nonlinear system when the final approach and landing of an aircraft are considered. It involves maneuvering flight in an appropriate course to the airport and then along the optimum glide path trajectory to the runway. We know that this path is usually provided by an instrument landing system, which transmits two radio signals to the aircraft as a navigational aid. These orthogonal radio beams are known as the localizer and the glide slope and are transmitted from the ends of the runway in order to provide the approaching aircraft with the correct trajectory for landing. The pilot executing such a landing must monitor cockpit instruments that display the position of the aircraft relative to the desired flight path and make appropriate corrections to the controls. Presume that four positions are available to the pilot and that four corrections P1, P2, P3 and P4 from the actual position P are required to put the aircraft on the correct course. The pairwise comparisons for the four positions are as follows :

$f_{P_1}(P_1) = 1$ $f_{P_1}(P_2) = 0.5$ $f_{P_1}(P_3) = 0.6$ $f_{P_1}(P_4) = 0.8$
$f_{P_2}(P_1) = 0.3$ $f_{P_2}(P_2) = 1$ $f_{P_2}(P_3) = 0.4$ $f_{P_2}(P_4) = 0.3$
$f_{P_3}(P_1) = 0.6$ $f_{P_3}(P_2) = 0.4$ $f_{P_3}(P_3) = 1$ $f_{P_3}(P_4) = 0.6$
$f_{P_4}(P_1) = 0$ $f_{P_4}(P_2) = 0.3$ $f_{P_4}(P_3) = 0.6$ $f_{P_4}(P_4) = 1$

Now, from these values, compute the comparison matrix and determine the overall ranking.

OR

a) Explain following :
   i) Fuzzy linear programming ii) Nontransitive ranking.

b) Explain FSPC for measurement and attribute SPC.

5. Answer the following : **(4×5=20)**

a) Write a short note on Type 2 fuzzy.
b) Explain fuzzy ranking method.
c) List design steps in fuzzy control system.
d) Explain Fuzzy Cognitive Map.
e) Explain fuzzy linear regression with data.

Set P

SLR-VB – 198

Seat No.	

Set **Q**

B.E. (E&TC) (Part – II) Examination, 2017
FUZZY LOGIC (Old)

Day and Date : Thursday, 25-5-2017 Max. Marks : 80
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 answers : **(1×20=20)**

1) Interval valued fuzzy sets can further be generalized as _____
   a) Type II fuzzy sets b) Ordinary fuzzy sets
   c) Fuzzy power sets d) None

2) Rank ordering ambiguity demonstrated for both fuzzy and _____ variables.
   a) Static b) Constant c) Random d) None

3) In fuzzy expert systems, the knowledge is usually represented by the set of
   a) Fuzzy production rules b) Fuzzy nos.
   c) Fuzzy coefficients d) None

4) The model proposes two types of relation exist between symptoms and disease are _____
   a) Occurrence relation b) Comfirmability relation
   c) Both a) and b) d) None of these

5) Fuzzy regression analysis uses _____ to represent the coefficient.
   a) Fuzzy number b) Fuzzy coefficient
   c) Fuzzy function d) None

6) A/B is defined as _____
   a) The collection of all elements in the universe that reside in A and don't reside in B
   b) The collection of all elements in the universe that reside in B and don't reside in A
   c) Null set
   d) None

7) A U A' = X is called as _____
   a) Axiom of excluded middle b) Axiom of Contradiction
   c) Union operation d) None

8) Fuzzy system are _____
   a) Control system b) Rule based system
   c) Both a) and b) d) None

9) Implication connective is equivalent to Fuzzy relation R as _____
   a) $(A \times B) \cup (\overline{A} \times Y)$ b) $(A \times B) \cup (A \times Y)$
   c) $(A \times B) \cap (\overline{A} \times Y)$ d) None

P.T.O.

10) Centroid method is also known as _____
   a) Centre of area
   b) Centre of gravity
   c) Both a) and b)
   d) None

11) The support of a fuzzy set A within a universal set X is the crisp set that contain all elements of X that have _____
   a) Infinite membership grade in A
   b) Non zero membership grade in A
   c) Zero membership grade in A
   d) None

12) The induction is performed by _____
   a) Standard value
   b) Mean value calculations
   c) Entropy minimizations
   d) None

13) The optimum partition, U*, to be the partition that produces _____
   a) Max value of J function
   b) Min value of J function
   c) Value of J function
   d) None

14) Family of Fuzzy partition matrices, M_{FC}, for the classification involving C classes and n data points _____

   a) $\left\{ U \mid \mu ik \in [0,1]; \sum_{i=1}^{C} \mu ik = 1 \; ; \; 0 < \sum_{k=1}^{C} < n; \right\}$

   b) $\left\{ U \mid \mu ik \in [0,1] \; ; \; \sum_{i=1}^{C} \mu ik = 1 \; ; \; 0 < \sum_{i=1}^{C} < n; \right\}$

   c) $\left\{ U \mid \mu ik \in [0,1] \; ; \sum_{i=1}^{n} \mu ik = 1 \; ; \; 0 < \sum_{k=1}^{C} < n; \right\}$

   d) None

15) Cognitive maps graphically describes a system in terms of _____
   a) Concept variables
   b) Concept variables and causal relations
   c) Causal relations
   d) None

16) Fuzzy relation R based on, IF A, THEN B as _____
   a) $B \rightarrow A$
   b) $A \rightarrow B$
   c) $A \rightarrow \bar{B}$
   d) None

17) In simple fuzzy logic controllers, partition the universe of discourse by each variable into a number of fuzzy subsets, assigning each a _____
   a) Membership function
   b) IF-THEN rules
   c) Linguistic labels
   d) None

18) The physician's medical knowledge is represented as a fuzzy relation between _____
   a) Disease and patient
   b) Symptoms and patient
   c) Both a) and b)
   d) None of these

19) Chromosomes x and y, to which crossover operation is applied, is called
   a) Mutation
   b) Mates
   c) Fitness
   d) None

20) For Nontransitive ranking, we introduce a special notion of _____
   a) Transitive
   b) Relativity
   c) Ordinal ranking
   d) None

_____

SLR-VB – 198

Seat No.	

B.E. (E&TC) (Part – II) Examination, 2017
FUZZY LOGIC (Old)

Day and Date : Thursday, 25-5-2017 Marks : 60
Time : 10.00 a.m. to 1.00 p.m.

SECTION – I

2. Answer **any four** : **(4×5=20)**

a) Perform the following operations on intervals :
i) [3, 3] – [2, 5] ii) [3, 2] × [5, 3].

b) Consider the following two discrete fuzzy sets, which are defined on universe X = {–5, 5}: Construct relation for the rule IF A THEN B

$$A = \text{zero} = \left\{ \frac{1}{-2} + \frac{0.75}{-1} + \frac{0.25}{0} + \frac{0.55}{1} + \frac{0}{2} \right\} \quad B = \text{positive medium} = \left\{ \frac{1}{0} + \frac{0.5}{1} + \frac{0.56}{2} + \frac{0.5}{3} + \frac{0}{4} \right\}.$$

c) Explain methods of membership value assignment – intuition and inference.

d) Explain extension principle in fuzzy arithmetic.

e) Methane biofilters can be used to oxidize methane using biological activities. It has become necessary to compare performance of two test columns, A and B. The methane outflow level at the surface in nondimensional units of X = {50, 100, 150, 200], was detected and is tabulated below against the respective methane inflow into each test column. The following fuzzy sets represent the test columns.

$\underset{\sim}{A} = \left\{ \frac{0.15}{50} + \frac{0.25}{100} + \frac{0.5}{150} + \frac{0.7}{200} \right\}$ $\underset{\sim}{B} = \left\{ \frac{0.2}{50} + \frac{0.3}{100} + \frac{0.6}{150} + \frac{0.65}{200} \right\}$. Calculate the union, intersection and the difference for the test columns.

f) Using your own intuition and your own definitions of the universe of discourse, plot fuzzy membership functions for the following variables :
Age of people
i) Very young ii) Young iii) Middle-aged iv) Old v) Very old.

3. Answer the following : **(1×10=10)**

a) Two fuzzy sets and both defined on X, are as follows :

$\mu(x_i)$	x_1	x_2	x_3	x_4	x_5	x_6
$\underset{\sim}{A}$	0.1	0.6	0.8	0.9	0.7	0.1
$\underset{\sim}{B}$	0.9	0.7	0.5	0.2	0.1	0

Express the following λ-cut sets using Zadeh's notation.

a) $(\overline{\underset{\sim}{A}})_{0.7}$ b) $(\underset{\sim}{B})_{0.4}$ c) $(\underset{\sim}{A} \cup \underset{\sim}{B})_{0.7}$ d) $(\underset{\sim}{A} \cap \underset{\sim}{B})_{0.6}$

b) In fuzzy automata, generate fuzzy input and output states under following conditions.

Output Relation R = $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0.5 & 1 & 0.7 \end{bmatrix}$ and state transition relation

$$S = \left[\begin{bmatrix} 0 & 0.3 & 0.9 & 1 \\ 0.5 & 1 & 0 & 0.2 \\ 0.6 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0.2 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0.4 & 0 & 0.6 \end{bmatrix} \right].$$

With initial state C^1 = [1 0.8 0.6 0.4]
Inputs A1 = [0.4 0] A2 = [1 0] A3 = [1 0.7]

OR

b) What is defuzzification ? Explain methods of defuzzification.

SECTION – II

4. Answer the following : **(1×10=10)**

a) An aircraft control system is a totally nonlinear system when the final approach and landing of an aircraft are considered. It involves maneuvering flight in an appropriate course to the airport and then along the optimum glide path trajectory to the runway. We know that this path is usually provided by an instrument landing system, which transmits two radio signals to the aircraft as a navigational aid. These orthogonal radio beams are known as the localizer and the glide slope and are transmitted from the ends of the runway in order to provide the approaching aircraft with the correct trajectory for landing. The pilot executing such a landing must monitor cockpit instruments that display the position of the aircraft relative to the desired flight path and make appropriate corrections to the controls. Presume that four positions are available to the pilot and that four corrections P1, P2, P3 and P4 from the actual position P are required to put the aircraft on the correct course. The pairwise comparisons for the four positions are as follows :

$f_{P_1}(P_1) = 1$ $f_{P_1}(P_2) = 0.5$ $f_{P_1}(P_3) = 0.6$ $f_{P_1}(P_4) = 0.8$
$f_{P_2}(P_1) = 0.3$ $f_{P_2}(P_2) = 1$ $f_{P_2}(P_3) = 0.4$ $f_{P_2}(P_4) = 0.3$
$f_{P_3}(P_1) = 0.6$ $f_{P_3}(P_2) = 0.4$ $f_{P_3}(P_3) = 1$ $f_{P_3}(P_4) = 0.6$
$f_{P_4}(P_1) = 0$ $f_{P_4}(P_2) = 0.3$ $f_{P_4}(P_3) = 0.6$ $f_{P_4}(P_4) = 1$

Now, from these values, compute the comparison matrix and determine the overall ranking.

OR

a) Explain following :
   i) Fuzzy linear programming ii) Nontransitive ranking.

b) Explain FSPC for measurement and attribute SPC.

5. Answer the following : **(4×5=20)**

a) Write a short note on Type 2 fuzzy.
b) Explain fuzzy ranking method.
c) List design steps in fuzzy control system.
d) Explain Fuzzy Cognitive Map.
e) Explain fuzzy linear regression with data.

Set Q

SLR-VB – 198

Seat No.	

Set **R**

B.E. (E&TC) (Part – II) Examination, 2017
FUZZY LOGIC (Old)

Day and Date : Thursday, 25-5-2017 Max. Marks : 80
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 answers : **(1×20=20)**

1) Fuzzy relation R based on, IF A, THEN B as _____
   a) $B \rightarrow A$ b) $A \rightarrow B$ c) $A \rightarrow \overline{B}$ d) None

2) In simple fuzzy logic controllers, partition the universe of discourse by each variable into a number of fuzzy subsets, assigning each a _____
   a) Membership function b) IF-THEN rules
   c) Linguistic labels d) None

3) The physician's medical knowledge is represented as a fuzzy relation between _____
   a) Disease and patient b) Symptoms and patient
   c) Both a) and b) d) None of these

4) Chromosomes x and y, to which crossover operation is applied, is called
   a) Mutation b) Mates c) Fitness d) None

5) For Nontransitive ranking, we introduce a special notion of _____
   a) Transitive b) Relativity c) Ordinal ranking d) None

6) Interval valued fuzzy sets can further be generalized as _____
   a) Type II fuzzy sets b) Ordinary fuzzy sets
   c) Fuzzy power sets d) None

7) Rank ordering ambiguity demonstrated for both fuzzy and _____ variables.
   a) Static b) Constant c) Random d) None

8) In fuzzy expert systems, the knowledge is usually represented by the set of
   a) Fuzzy production rules b) Fuzzy nos.
   c) Fuzzy coefficients d) None

9) The model proposes two types of relation exist between symptoms and disease are _____
   a) Occurrence relation b) Comfirmability relation
   c) Both a) and b) d) None of these

10) Fuzzy regression analysis uses _____ to represent the coefficient.
   a) Fuzzy number b) Fuzzy coefficient
   c) Fuzzy function d) None

P.T.O.

11) A/B is defined as _____
   a) The collection of all elements in the universe that reside in A and don't reside in B
   b) The collection of all elements in the universe that reside in B and don't reside in A
   c) Null set
   d) None

12) A U A' = X is called as _____
   a) Axiom of excluded middle
   b) Axiom of Contradiction
   c) Union operation
   d) None

13) Fuzzy system are _____
   a) Control system
   b) Rule based system
   c) Both a) and b)
   d) None

14) Implication connective is equivalent to Fuzzy relation R as _____
   a) $(A \times B) \cup (\overline{A} \times Y)$
   b) $(A \times B) \cup (A \times Y)$
   c) $(A \times B) \cap (\overline{A} \times Y)$
   d) None

15) Centroid method is also known as _____
   a) Centre of area
   b) Centre of gravity
   c) Both a) and b)
   d) None

16) The support of a fuzzy set A within a universal set X is the crisp set that contain all elements of X that have _____
   a) Infinite membership grade in A
   b) Non zero membership grade in A
   c) Zero membership grade in A
   d) None

17) The induction is performed by _____
   a) Standard value
   b) Mean value calculations
   c) Entropy minimizations
   d) None

18) The optimum partition, U*, to be the partition that produces _____
   a) Max value of J function
   b) Min value of J function
   c) Value of J function
   d) None

19) Family of Fuzzy partition matrices, M_{FC}, for the classification involving C classes and n data points _____
   a) $\left\{ U \mid \mu ik \in [0,1]; \Sigma_{i=1}^{C} \mu ik = 1 \; ; \; 0 < \Sigma_{k=1}^{C} < n; \right\}$
   b) $\left\{ U \mid \mu ik \in [0,1] \; ; \; \Sigma_{i=1}^{C} \mu ik = 1 \; ; \; 0 < \Sigma_{i=1}^{C} < n; \right\}$
   c) $\left\{ U \mid \mu ik \in [0,1] \; ; \Sigma_{i=1}^{n} \mu ik = 1 \; ; \; 0 < \Sigma_{k=1}^{C} < n; \right\}$
   d) None

20) Cognitive maps graphically describes a system in terms of _____
   a) Concept variables
   b) Concept variables and causal relations
   c) Causal relations
   d) None

_____

SLR-VB – 198

Seat No.	

B.E. (E&TC) (Part – II) Examination, 2017
FUZZY LOGIC (Old)

Day and Date : Thursday, 25-5-2017 Marks : 60
Time : 10.00 a.m. to 1.00 p.m.

SECTION – I

2. Answer **any four** : **(4×5=20)**

a) Perform the following operations on intervals :
i) [3, 3] – [2, 5] ii) [3, 2] × [5, 3].

b) Consider the following two discrete fuzzy sets, which are defined on universe X = {–5, 5}: Construct relation for the rule IF A THEN B

$$A = \text{zero} = \left\{ \frac{1}{-2} + \frac{0.75}{-1} + \frac{0.25}{0} + \frac{0.55}{1} + \frac{0}{2} \right\} \quad B = \text{positive medium} = \left\{ \frac{1}{0} + \frac{0.5}{1} + \frac{0.56}{2} + \frac{0.5}{3} + \frac{0}{4} \right\}.$$

c) Explain methods of membership value assignment – intuition and inference.

d) Explain extension principle in fuzzy arithmetic.

e) Methane biofilters can be used to oxidize methane using biological activities. It has become necessary to compare performance of two test columns, A and B. The methane outflow level at the surface in nondimensional units of X = {50, 100, 150, 200], was detected and is tabulated below against the respective methane inflow into each test column. The following fuzzy sets represent the test columns.

$\underset{\sim}{A} = \left\{ \frac{0.15}{50} + \frac{0.25}{100} + \frac{0.5}{150} + \frac{0.7}{200} \right\}$ $\underset{\sim}{B} = \left\{ \frac{0.2}{50} + \frac{0.3}{100} + \frac{0.6}{150} + \frac{0.65}{200} \right\}$. Calculate the union, intersection and the difference for the test columns.

f) Using your own intuition and your own definitions of the universe of discourse, plot fuzzy membership functions for the following variables :
Age of people
i) Very young ii) Young iii) Middle-aged iv) Old v) Very old.

3. Answer the following : **(1×10=10)**

a) Two fuzzy sets and both defined on X, are as follows :

$\mu(x_i)$	x_1	x_2	x_3	x_4	x_5	x_6
$\underset{\sim}{A}$	0.1	0.6	0.8	0.9	0.7	0.1
$\underset{\sim}{B}$	0.9	0.7	0.5	0.2	0.1	0

Express the following λ-cut sets using Zadeh's notation.

a) $(\overline{\underset{\sim}{A}})_{0.7}$ b) $(\underset{\sim}{B})_{0.4}$ c) $(\underset{\sim}{A} \cup \underset{\sim}{B})_{0.7}$ d) $(\underset{\sim}{A} \cap \underset{\sim}{B})_{0.6}$

b) In fuzzy automata, generate fuzzy input and output states under following conditions.

Output Relation R = $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0.5 & 1 & 0.7 \end{bmatrix}$ and state transition relation

$$S = \left[\begin{bmatrix} 0 & 0.3 & 0.9 & 1 \\ 0.5 & 1 & 0 & 0.2 \\ 0.6 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0.2 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0.4 & 0 & 0.6 \end{bmatrix} \right].$$

With initial state C^1 = [1 0.8 0.6 0.4]
Inputs A1 = [0.4 0] A2 = [1 0] A3 = [1 0.7]

OR

b) What is defuzzification ? Explain methods of defuzzification.

SECTION – II

4. Answer the following : **(1×10=10)**

a) An aircraft control system is a totally nonlinear system when the final approach and landing of an aircraft are considered. It involves maneuvering flight in an appropriate course to the airport and then along the optimum glide path trajectory to the runway. We know that this path is usually provided by an instrument landing system, which transmits two radio signals to the aircraft as a navigational aid. These orthogonal radio beams are known as the localizer and the glide slope and are transmitted from the ends of the runway in order to provide the approaching aircraft with the correct trajectory for landing. The pilot executing such a landing must monitor cockpit instruments that display the position of the aircraft relative to the desired flight path and make appropriate corrections to the controls. Presume that four positions are available to the pilot and that four corrections P1, P2, P3 and P4 from the actual position P are required to put the aircraft on the correct course. The pairwise comparisons for the four positions are as follows :

$f_{P_1}(P_1) = 1$ $f_{P_1}(P_2) = 0.5$ $f_{P_1}(P_3) = 0.6$ $f_{P_1}(P_4) = 0.8$
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$f_{P_3}(P_1) = 0.6$ $f_{P_3}(P_2) = 0.4$ $f_{P_3}(P_3) = 1$ $f_{P_3}(P_4) = 0.6$
$f_{P_4}(P_1) = 0$ $f_{P_4}(P_2) = 0.3$ $f_{P_4}(P_3) = 0.6$ $f_{P_4}(P_4) = 1$

Now, from these values, compute the comparison matrix and determine the overall ranking.

OR

a) Explain following :
   i) Fuzzy linear programming ii) Nontransitive ranking.

b) Explain FSPC for measurement and attribute SPC.

5. Answer the following : **(4×5=20)**

a) Write a short note on Type 2 fuzzy.
b) Explain fuzzy ranking method.
c) List design steps in fuzzy control system.
d) Explain Fuzzy Cognitive Map.
e) Explain fuzzy linear regression with data.

Set R

SLR-VB – 198

Seat No.	

Set **S**

B.E. (E&TC) (Part – II) Examination, 2017
FUZZY LOGIC (Old)

Day and Date : Thursday, 25-5-2017 Max. Marks : 80
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 answers : **(1×20=20)**

1) The support of a fuzzy set A within a universal set X is the crisp set that contain all elements of X that have _____
   a) Infinite membership grade in A
   b) Non zero membership grade in A
   c) Zero membership grade in A
   d) None

2) The induction is performed by _____
   a) Standard value
   b) Mean value calculations
   c) Entropy minimizations
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3) The optimum partition, U*, to be the partition that produces _____
   a) Max value of J function
   b) Min value of J function
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4) Family of Fuzzy partition matrices, M_{FC}, for the classification involving C classes and n data points _____
   a) $\left\{ U \mid \mu ik \in [0,1]; \Sigma_{i=1}^{C} \mu ik = 1 \; ; \; 0 < \Sigma_{k=1}^{C} < n; \right\}$
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   c) $\left\{ U \mid \mu ik \in [0,1] \; ; \Sigma_{i=1}^{n} \mu ik = 1 \; ; \; 0 < \Sigma_{k=1}^{C} < n; \right\}$
   d) None

5) Cognitive maps graphically describes a system in terms of _____
   a) Concept variables
   b) Concept variables and causal relations
   c) Causal relations
   d) None

6) Fuzzy relation R based on, IF A, THEN B as _____
   a) $B \rightarrow A$ b) $A \rightarrow B$ c) $A \rightarrow \bar{B}$ d) None

P.T.O.

7) In simple fuzzy logic controllers, partition the universe of discourse by each variable into a number of fuzzy subsets, assigning each a _____
   a) Membership function b) IF-THEN rules
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8) The physician's medical knowledge is represented as a fuzzy relation between _____
   a) Disease and patient b) Symptoms and patient
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9) Chromosomes x and y, to which crossover operation is applied, is called
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10) For Nontransitive ranking, we introduce a special notion of _____
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11) Interval valued fuzzy sets can further be generalized as _____
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   b) The collection of all elements in the universe that reside in B and don't reside in A
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17) A U A' = X is called as _____
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20) Centroid method is also known as _____
   a) Centre of area b) Centre of gravity
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_____

SLR-VB – 198

Seat No.	

B.E. (E&TC) (Part – II) Examination, 2017
FUZZY LOGIC (Old)

Day and Date : Thursday, 25-5-2017 Marks : 60
Time : 10.00 a.m. to 1.00 p.m.

SECTION – I

2. Answer **any four** : **(4×5=20)**

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c) Explain methods of membership value assignment – intuition and inference.

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e) Methane biofilters can be used to oxidize methane using biological activities. It has become necessary to compare performance of two test columns, A and B. The methane outflow level at the surface in nondimensional units of X = {50, 100, 150, 200], was detected and is tabulated below against the respective methane inflow into each test column. The following fuzzy sets represent the test columns.

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b) In fuzzy automata, generate fuzzy input and output states under following conditions.

Output Relation R = $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0.5 & 1 & 0.7 \end{bmatrix}$ and state transition relation

$$S = \left[\begin{bmatrix} 0 & 0.3 & 0.9 & 1 \\ 0.5 & 1 & 0 & 0.2 \\ 0.6 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0.2 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0.4 & 0 & 0.6 \end{bmatrix} \right].$$

With initial state $C^1 = [1 \ 0.8 \ 0.6 \ 0.4]$
Inputs A1 = [0.4 0] A2 = [1 0] A3 = [1 0.7]

OR

b) What is defuzzification ? Explain methods of defuzzification.

SECTION – II

4. Answer the following : **(1×10=10)**

a) An aircraft control system is a totally nonlinear system when the final approach and landing of an aircraft are considered. It involves maneuvering flight in an appropriate course to the airport and then along the optimum glide path trajectory to the runway. We know that this path is usually provided by an instrument landing system, which transmits two radio signals to the aircraft as a navigational aid. These orthogonal radio beams are known as the localizer and the glide slope and are transmitted from the ends of the runway in order to provide the approaching aircraft with the correct trajectory for landing. The pilot executing such a landing must monitor cockpit instruments that display the position of the aircraft relative to the desired flight path and make appropriate corrections to the controls. Presume that four positions are available to the pilot and that four corrections P1, P2, P3 and P4 from the actual position P are required to put the aircraft on the correct course. The pairwise comparisons for the four positions are as follows :

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$f_{P_2}(P_1) = 0.3$ $f_{P_2}(P_2) = 1$ $f_{P_2}(P_3) = 0.4$ $f_{P_2}(P_4) = 0.3$
$f_{P_3}(P_1) = 0.6$ $f_{P_3}(P_2) = 0.4$ $f_{P_3}(P_3) = 1$ $f_{P_3}(P_4) = 0.6$
$f_{P_4}(P_1) = 0$ $f_{P_4}(P_2) = 0.3$ $f_{P_4}(P_3) = 0.6$ $f_{P_4}(P_4) = 1$

Now, from these values, compute the comparison matrix and determine the overall ranking.

OR

a) Explain following :
   i) Fuzzy linear programming ii) Nontransitive ranking.

b) Explain FSPC for measurement and attribute SPC.

5. Answer the following : **(4×5=20)**

a) Write a short note on Type 2 fuzzy.
b) Explain fuzzy ranking method.
c) List design steps in fuzzy control system.
d) Explain Fuzzy Cognitive Map.
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Set S