SLR-VB – 127

Seat No.	

Set P

S.E. (Electronics) (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 – 127

Seat No.	

S.E. (Electronics) (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 P

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Seat No.	

Set Q

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P.T.O.

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_____

SLR-VB – 127

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ENGINEERING MATHEMATICS – III

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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 – 127

Seat No.	

Set R

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

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MCQ/Objective Type Questions

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P.T.O.

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$y'' + 9y = 18t$
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

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Seat No.	

Set S

S.E. (Electronics) (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

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S.E. (Electronics) (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.

Instructions *: 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**

   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

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Set **P**

S.E. (Electronics) (Part – I) (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)* ***All*** *questions are* ***compulsory****.*
2) Assume suitable data if ***required****.*
3) Figures to ***right*** *indicate* ***maximum*** *marks.*
4) ***Use*** *of data sheet is* ***allowed****.*
5) Q. No. ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
6) ***Answer MCQ/Objective 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) Zener diode in breakdown region is used as
   a) Resistance regulator b) Rectifier
   c) Current regulator d) Voltage regulator

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

3) The capacitance of a reverse biased PN junction
   a) Decreases as the reverse bias is increased
   b) Increases as the reverse bias is increased
   c) Depends mainly on reverse saturation
   d) None of these

4) For full wave rectifier, if input supply frequency is 50 Hz, then output frequency will be
   a) 50 Hz b) 100 Hz c) 75 Hz d) 200 Hz

5) The critical inductance in a filter circuit is
   a) to ensure that current flows at all time
   b) current never becomes zero
   c) minimum inductance required in circuit
   d) all above

6) Ripple factor increases in capacitor filter
   a) With decreasing load resistance
   b) With increasing load resistance
   c) With increase in capacitor value
   d) None

7) The Ripple factor is independent of load resistance in
   a) C filter b) L filter c) LC filter d) CLC filter

8) The term Punch through effect is associated with
   a) JFET b) Transistor c) DMOSFET d) EMOSFET

9) Input impedance of JFET amplifier is
   a) Very low b) Same as transistor
   c) Very high d) Both (a) and (b)

10) MOSFET is
   a) Unipolar device b) Voltage controlled device
   c) Current controlled device d) Both (a) and (b)

11) Which of the following components are used for bias compensation in transistorized circuit ?
   a) Resistors b) Diodes c) Thermistors d) Both (b) and (c)

12) If β_{dc} is 50, then value of α_{dc} is
   a) 50 b) 51 c) $\frac{50}{51}$ d) $\frac{1}{50}$

13) Voltage-divider bias provides
   a) Stable Q point
   b) Q point variation with change in gain
   c) Q point variation with change in I_C
   d) Unstable Q point

14) Output of RC coupled stage CE amplifier is _____ of input signal.
   a) 90° out of phase b) 180° out of phase
   c) In phase d) 360° out of phase

_____

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Seat No.	

S.E. (Electronics) (Part – I) (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.

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

SECTION – I

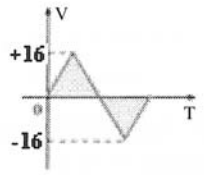
2. Attempt **any four** : **(4×4=16)**

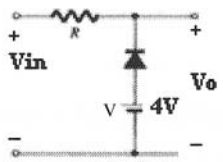
a) Explain VI characteristics from diode current equation. What is static and dynamic resistance of diode ?

b) Explain working of full wave voltage doubler circuit.

c) Derive an expression of ripple factor for capacitor filter with full wave rectifier.

d) Sketch output waveform V_{out} and transfer characteristics for following network. V_{in} is 16 V peak triangular wave.





e) Design a shunt regulator using Zener to provide 10 V output from 15 V unregulated power supply. Assume Power dissipation = 0.4 Watt.

3. Attempt **any two** : **(2×6=12)**

a) Derive following parameters for full wave rectifier circuit with center tap transformer. V_{dc}, V_{rms} , Efficiency , Ripple factor.

b) What is Clamper ? Describe operation of positive clamper and negative clamper.

c) Design LC filter using full wave rectifier to provide 15 V dc at 150 mA with maximum ripple content of 1%.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

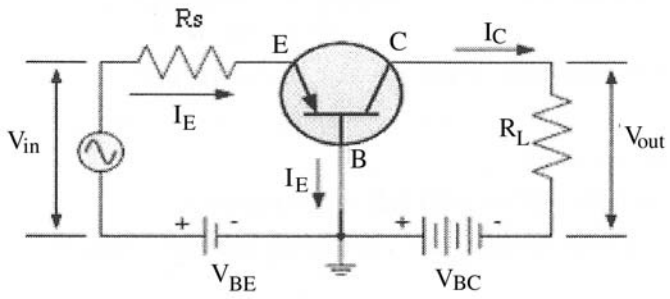
a) Explain application of JFET as VVR.

b) Discuss thermal stability of transistor bias circuit with regard to I_{CO} and V_{BE}.

c) Define stability factor S. Derive the general expression for stability factor of biasing circuits.

d) Explain BJT early effect and punch through effect and how it occurs.

e) Consider a CB amplifier as shown in above figure. If h_{ib}= 20 Ω , h_{rb}= 0.0003 , h_{fb} = 0.98, h_{ob} = 0.5 μmho , R_s = 600 Ω , R_L = 1.5 KΩ , calculate A_i, A_v, R_i, R_o.



5. Attempt **any two** : **(2×6=12)**

a) With suitable circuit explain working of transistorized monostable multivibrator and derive an expression for its pulse width. Sketch associated waveforms.

b) Design a single stage CE amplifier to provide a voltage gain of 100 with stability factor 10 and output voltage of 4 V (peak) using transistor BC147B. Use V_{cc} = 12 V, h_{fe} = 240, h_{ie} = 4.5 KΩ .

c) Why MOSFET is called as voltage controlled device ? Explain construction, working, drain and transfer characteristics of N channel EMOSFET.

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Seat No.	

Set Q

S.E. (Electronics) (Part – I) (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)* ***All*** *questions are* ***compulsory****.*
2) Assume suitable data if ***required****.*
3) Figures to ***right*** *indicate* ***maximum*** *marks.*
4) ***Use*** *of data sheet is* ***allowed****.*
5) Q. No. ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
6) ***Answer MCQ/Objective 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 term Punch through effect is associated with
a) JFET b) Transistor c) DMOSFET d) EMOSFET

2) Input impedance of JFET amplifier is
a) Very low b) Same as transistor
c) Very high d) Both (a) and (b)

3) MOSFET is
a) Unipolar device b) Voltage controlled device
c) Current controlled device d) Both (a) and (b)

4) Which of the following components are used for bias compensation in transistorized circuit ?
a) Resistors b) Diodes c) Thermistors d) Both (b) and (c)

5) If β_{dc} is 50, then value of α_{dc} is
a) 50 b) 51 c) $\frac{50}{51}$ d) $\frac{1}{50}$

6) Voltage-divider bias provides
a) Stable Q point
b) Q point variation with change in gain
c) Q point variation with change in I_C
d) Unstable Q point

P.T.O.

7) Output of RC coupled stage CE amplifier is _____ of input signal.
   a) 90° out of phase b) 180° out of phase
   c) In phase d) 360° out of phase

8) Zener diode in breakdown region is used as
   a) Resistance regulator b) Rectifier
   c) Current regulator d) Voltage regulator

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

10) The capacitance of a reverse biased PN junction
   a) Decreases as the reverse bias is increased
   b) Increases as the reverse bias is increased
   c) Depends mainly on reverse saturation
   d) None of these

11) For full wave rectifier, if input supply frequency is 50 Hz, then output frequency will be
   a) 50 Hz b) 100 Hz c) 75 Hz d) 200 Hz

12) The critical inductance in a filter circuit is
   a) to ensure that current flows at all time
   b) current never becomes zero
   c) minimum inductance required in circuit
   d) all above

13) Ripple factor increases in capacitor filter
   a) With decreasing load resistance
   b) With increasing load resistance
   c) With increase in capacitor value
   d) None

14) The Ripple factor is independent of load resistance in
   a) C filter b) L filter c) LC filter d) CLC filter

_____

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Seat No.	

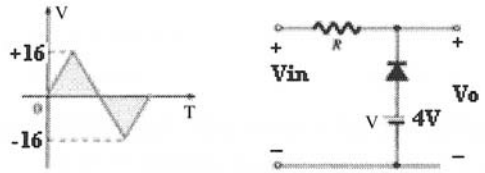
S.E. (Electronics) (Part – I) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

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

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   a) Explain VI characteristics from diode current equation. What is static and dynamic resistance of diode ?
   b) Explain working of full wave voltage doubler circuit.
   c) Derive an expression of ripple factor for capacitor filter with full wave rectifier.
   d) Sketch output waveform V_{out} and transfer characteristics for following network. V_{in} is 16 V peak triangular wave.



   e) Design a shunt regulator using Zener to provide 10 V output from 15 V unregulated power supply. Assume Power dissipation = 0.4 Watt.

3. Attempt **any two** : **(2×6=12)**
   a) Derive following parameters for full wave rectifier circuit with center tap transformer. V_{dc}, V_{rms} , Efficiency , Ripple factor.
   b) What is Clamper ? Describe operation of positive clamper and negative clamper.
   c) Design LC filter using full wave rectifier to provide 15 V dc at 150 mA with maximum ripple content of 1%.

Set Q

SECTION – II

4. Attempt **any four** : **(4×4=16)**

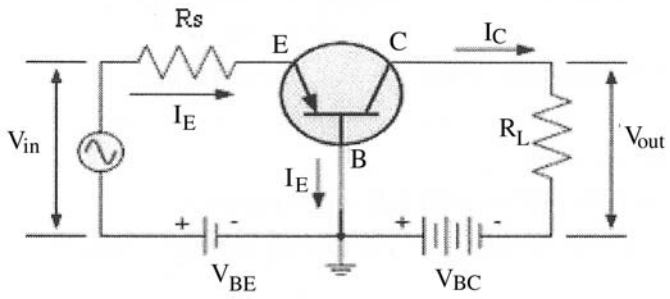
a) Explain application of JFET as VVR.

b) Discuss thermal stability of transistor bias circuit with regard to I_{CO} and V_{BE}.

c) Define stability factor S. Derive the general expression for stability factor of biasing circuits.

d) Explain BJT early effect and punch through effect and how it occurs.

e) Consider a CB amplifier as shown in above figure. If $h_{ib}= 20\,\Omega$, $h_{rb}= 0.0003$, $h_{fb} = 0.98$, $h_{ob} = 0.5\ \mu mho$, $R_s = 600\,\Omega$, $R_L = 1.5\ K\Omega$, calculate A_i, A_v, R_i, R_o.



5. Attempt **any two** : **(2×6=12)**

a) With suitable circuit explain working of transistorized monostable multivibrator and derive an expression for its pulse width. Sketch associated waveforms.

b) Design a single stage CE amplifier to provide a voltage gain of 100 with stability factor 10 and output voltage of 4 V (peak) using transistor BC147B. Use $V_{cc} = 12$ V, $h_{fe} = 240$, $h_{ie} = 4.5\ K\Omega$.

c) Why MOSFET is called as voltage controlled device ? Explain construction, working, drain and transfer characteristics of N channel EMOSFET.

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Seat No.	

Set R

S.E. (Electronics) (Part – I) (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)* ***All*** *questions are* ***compulsory****.*
2) Assume suitable data if ***required****.*
3) Figures to ***right*** *indicate* ***maximum*** *marks.*
4) ***Use*** *of data sheet is* ***allowed****.*
5) Q. No. ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
6) ***Answer MCQ/Objective 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 critical inductance in a filter circuit is
   a) to ensure that current flows at all time
   b) current never becomes zero
   c) minimum inductance required in circuit
   d) all above

2) Ripple factor increases in capacitor filter
   a) With decreasing load resistance
   b) With increasing load resistance
   c) With increase in capacitor value
   d) None

3) The Ripple factor is independent of load resistance in
   a) C filter b) L filter c) LC filter d) CLC filter

4) The term Punch through effect is associated with
   a) JFET b) Transistor c) DMOSFET d) EMOSFET

5) Input impedance of JFET amplifier is
   a) Very low b) Same as transistor
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P.T.O.

6) MOSFET is
   a) Unipolar device
   b) Voltage controlled device
   c) Current controlled device
   d) Both (a) and (b)

7) Which of the following components are used for bias compensation in transistorized circuit ?
   a) Resistors b) Diodes c) Thermistors d) Both (b) and (c)

8) If β_{dc} is 50, then value of α_{dc} is
   a) 50 b) 51 c) $\frac{50}{51}$ d) $\frac{1}{50}$

9) Voltage-divider bias provides
   a) Stable Q point
   b) Q point variation with change in gain
   c) Q point variation with change in I_C
   d) Unstable Q point

10) Output of RC coupled stage CE amplifier is _____ of input signal.
   a) 90° out of phase
   b) 180° out of phase
   c) In phase
   d) 360° out of phase

11) Zener diode in breakdown region is used as
   a) Resistance regulator
   b) Rectifier
   c) Current regulator
   d) Voltage regulator

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

13) The capacitance of a reverse biased PN junction
   a) Decreases as the reverse bias is increased
   b) Increases as the reverse bias is increased
   c) Depends mainly on reverse saturation
   d) None of these

14) For full wave rectifier, if input supply frequency is 50 Hz, then output frequency will be
   a) 50 Hz b) 100 Hz c) 75 Hz d) 200 Hz

_____

SLR-VB – 128

Seat No.	

S.E. (Electronics) (Part – I) (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.

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

SECTION – I

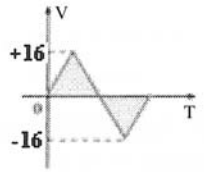
2. Attempt **any four** : **(4×4=16)**

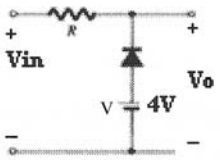
a) Explain VI characteristics from diode current equation. What is static and dynamic resistance of diode ?

b) Explain working of full wave voltage doubler circuit.

c) Derive an expression of ripple factor for capacitor filter with full wave rectifier.

d) Sketch output waveform V_{out} and transfer characteristics for following network. V_{in} is 16 V peak triangular wave.





e) Design a shunt regulator using Zener to provide 10 V output from 15 V unregulated power supply. Assume Power dissipation = 0.4 Watt.

3. Attempt **any two** : **(2×6=12)**

a) Derive following parameters for full wave rectifier circuit with center tap transformer. V_{dc}, V_{rms} , Efficiency , Ripple factor.

b) What is Clamper ? Describe operation of positive clamper and negative clamper.

c) Design LC filter using full wave rectifier to provide 15 V dc at 150 mA with maximum ripple content of 1%.

Set R

SECTION – II

4. Attempt **any four** : **(4×4=16)**

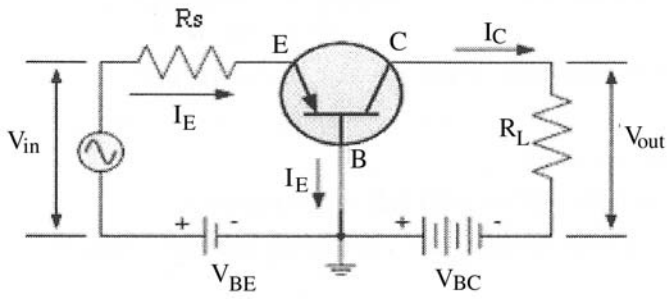
a) Explain application of JFET as VVR.

b) Discuss thermal stability of transistor bias circuit with regard to I_{CO} and V_{BE}.

c) Define stability factor S. Derive the general expression for stability factor of biasing circuits.

d) Explain BJT early effect and punch through effect and how it occurs.

e) Consider a CB amplifier as shown in above figure. If h_{ib}= 20 Ω , h_{rb}= 0.0003 , h_{fb} = 0.98, h_{ob} = 0.5 μmho , R_s = 600 Ω , R_L = 1.5 KΩ , calculate A_i, A_v, R_i, R_o.



5. Attempt **any two** : **(2×6=12)**

a) With suitable circuit explain working of transistorized monostable multivibrator and derive an expression for its pulse width. Sketch associated waveforms.

b) Design a single stage CE amplifier to provide a voltage gain of 100 with stability factor 10 and output voltage of 4 V (peak) using transistor BC147B. Use V_{cc} = 12 V, h_{fe} = 240, h_{ie} = 4.5 KΩ .

c) Why MOSFET is called as voltage controlled device ? Explain construction, working, drain and transfer characteristics of N channel EMOSFET.

SLR-VB – 128

Seat No.	

Set S

S.E. (Electronics) (Part – I) (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)* ***All*** *questions are* ***compulsory****.*
2) Assume suitable data if ***required****.*
3) Figures to ***right*** *indicate* ***maximum*** *marks.*
4) ***Use*** *of data sheet is* ***allowed****.*
5) Q. No. ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
6) ***Answer MCQ/Objective 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) MOSFET is
   a) Unipolar device
   b) Voltage controlled device
   c) Current controlled device
   d) Both (a) and (b)

2) Which of the following components are used for bias compensation in transistorized circuit ?
   a) Resistors b) Diodes c) Thermistors d) Both (b) and (c)

3) If β_{dc} is 50, then value of α_{dc} is
   a) 50 b) 51 c) $\frac{50}{51}$ d) $\frac{1}{50}$

4) Voltage-divider bias provides
   a) Stable Q point
   b) Q point variation with change in gain
   c) Q point variation with change in I_C
   d) Unstable Q point

5) Output of RC coupled stage CE amplifier is _____ of input signal.
   a) 90° out of phase
   b) 180° out of phase
   c) In phase
   d) 360° out of phase

P.T.O.

6) Zener diode in breakdown region is used as
   a) Resistance regulator b) Rectifier
   c) Current regulator d) Voltage regulator

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

8) The capacitance of a reverse biased PN junction
   a) Decreases as the reverse bias is increased
   b) Increases as the reverse bias is increased
   c) Depends mainly on reverse saturation
   d) None of these

9) For full wave rectifier, if input supply frequency is 50 Hz, then output frequency will be
   a) 50 Hz b) 100 Hz c) 75 Hz d) 200 Hz

10) The critical inductance in a filter circuit is
   a) to ensure that current flows at all time
   b) current never becomes zero
   c) minimum inductance required in circuit
   d) all above

11) Ripple factor increases in capacitor filter
   a) With decreasing load resistance
   b) With increasing load resistance
   c) With increase in capacitor value
   d) None

12) The Ripple factor is independent of load resistance in
   a) C filter b) L filter c) LC filter d) CLC filter

13) The term Punch through effect is associated with
   a) JFET b) Transistor c) DMOSFET d) EMOSFET

14) Input impedance of JFET amplifier is
   a) Very low b) Same as transistor
   c) Very high d) Both (a) and (b)

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SLR-VB – 128

Seat No.	

S.E. (Electronics) (Part – I) (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.

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

SECTION – I

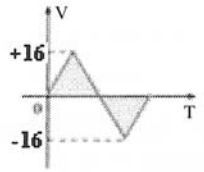
2. Attempt **any four** : **(4×4=16)**

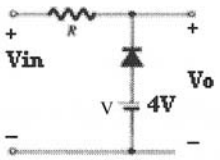
a) Explain VI characteristics from diode current equation. What is static and dynamic resistance of diode ?

b) Explain working of full wave voltage doubler circuit.

c) Derive an expression of ripple factor for capacitor filter with full wave rectifier.

d) Sketch output waveform V_{out} and transfer characteristics for following network. V_{in} is 16 V peak triangular wave.





e) Design a shunt regulator using Zener to provide 10 V output from 15 V unregulated power supply. Assume Power dissipation = 0.4 Watt.

3. Attempt **any two** : **(2×6=12)**

a) Derive following parameters for full wave rectifier circuit with center tap transformer. V_{dc}, V_{rms} , Efficiency , Ripple factor.

b) What is Clamper ? Describe operation of positive clamper and negative clamper.

c) Design LC filter using full wave rectifier to provide 15 V dc at 150 mA with maximum ripple content of 1%.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

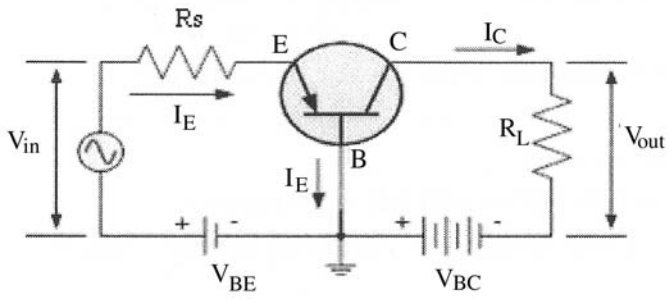
a) Explain application of JFET as VVR.

b) Discuss thermal stability of transistor bias circuit with regard to I_{CO} and V_{BE}.

c) Define stability factor S. Derive the general expression for stability factor of biasing circuits.

d) Explain BJT early effect and punch through effect and how it occurs.

e) Consider a CB amplifier as shown in above figure. If h_{ib}= 20 Ω , h_{rb}= 0.0003 , h_{fb} = 0.98, h_{ob} = 0.5 μmho , R_s = 600 Ω , R_L = 1.5 KΩ , calculate A_i, A_v, R_i, R_o.



5. Attempt **any two** : **(2×6=12)**

a) With suitable circuit explain working of transistorized monostable multivibrator and derive an expression for its pulse width. Sketch associated waveforms.

b) Design a single stage CE amplifier to provide a voltage gain of 100 with stability factor 10 and output voltage of 4 V (peak) using transistor BC147B. Use V_{cc} = 12 V, h_{fe} = 240, h_{ie} = 4.5 KΩ .

c) Why MOSFET is called as voltage controlled device ? Explain construction, working, drain and transfer characteristics of N channel EMOSFET.

SLR-VB – 129

Seat No.	

Set **P**

S.E. (Electronics) (Part – I) (CGPA) Examination, 2017
NETWORK THEORY AND ANALYSIS

Day and Date : Saturday, 6-5-2017 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.***
*3) Figures to the **right** indicate **full** marks.*
*4) Assume suitable data **whenever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes

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

1) One of the following laws of electrical n/ws is used in node analysis of the n/w
   a) KVL b) KCL c) Faradays law d) Ohms law

2) In applying the superposition theorem
   a) the sources are considered one at a time with all others replaced by their internal impedance
   b) all sources are considered independently
   c) all sources are considered simultaneously
   d) none of the above

3) In a series RLC circuit, if C is increased what happens to the resonant frequency ?
   a) It increases b) It decreases
   c) It remains the same d) It is zero

4) In a series RLC with L = 15 H, C = 0,015 μ F and R = 80 phm, what is the impedance at the resonant frequency ?
   a) (15 mH) ω b) (0.015 F) ω
   c) 80 ohm d) 80 mho

5) In a parallel resonance circuit, why does the current lag behind the source voltage at frequencies below resonance ?
   a) Because the circuit is predominantly resistive
   b) Because the circuit is predominantly inductive
   c) Because the circuit is predominantly capacitive
   d) None of the above

6) Two port network are connected in cascade, the combination is to be represented as a single two port network, the parameters of the network are obtained by multiplying the individuals
   a) Z parameter matrix b) H parameter matrix
   c) Y parameter matrix d) Transmission parameter matrix

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

8) The system is said to be stable, if and only if
   a) all the poles lie on right half of the s-plane
   b) some poles lie on right half of the s-palne
   c) all the poles lie on imaginary axis of the s-plane
   d) all the poles lie on left half of the s-plane

9) In a certain high-pass filter, fc = 5 kHz. Its pass band is
   a) 0 Hz to 5 kHz b) 5 kHz to infinity
   c) 5 kHz 10 kHz d) Can't say

10) The function is said to be having simple poles and zeros only if
   a) The poles are not repeated
   b) The zeros are not repeated
   c) The poles and zeros are not repeated
   d) None of the above

11) Inductor does not allow sudden changes
   a) in current b) in voltage
   c) both (a) and (b) d) none of the above

12) The time constant of series RL circuit is
   a) LR b) L/R c) R/I d) $e^{-R/L}$

13) Parallel connection of LPF with cutofff frequency f_1 and HPF with cutoff frequency f_2 gives band stop filter if
   a) $F_1 < f_2$ b) $f_1 > f_2$ c) $f_1 = f_2$ d) none of the above

14) Attenuation of 1 Neper = _____ dB.
   a) 6.868 b) 8.886 c) 6.686 d) 8.686

_____

SLR-VB – 129

Seat No.	

S.E. (Electronics) (Part – I) (CGPA) Examination, 2017
NETWORK THEORY AND ANALYSIS

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

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) Assume suitable data ***whenever*** *necessary.*

SECTION – I

2. Answer **any four** : **(4×4=16)**

a) Find Thevenin's equivalent circuit for the circuit shown in Fig. 1

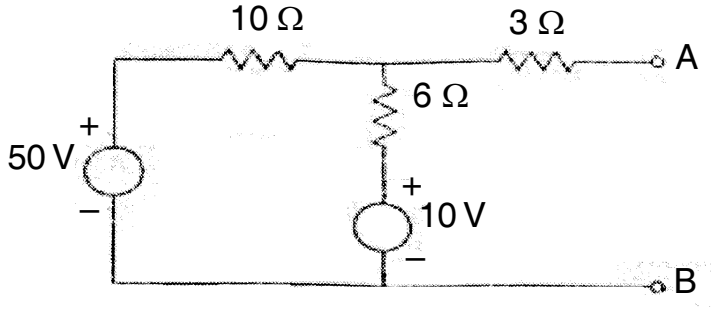


Fig. 1

b) State and prove maximum power transfer theorem.

c) Find driving point impedance in terms of Z parameters at the input port of a load terminated network.

d) A series RLC circuit with R = 50 ohm, L = 0.5 H, and C = 20 μ F and applied voltage is of 20 V. Determine the resonant frequency and voltage across the capacitor at resonance.

e) Derive the equation for resonant frequency for a Tank circuit.

3. Answer **any two** : **(6×2=12)**

a) Determine the current I shown in Fig. 2 by using superposition theorem.

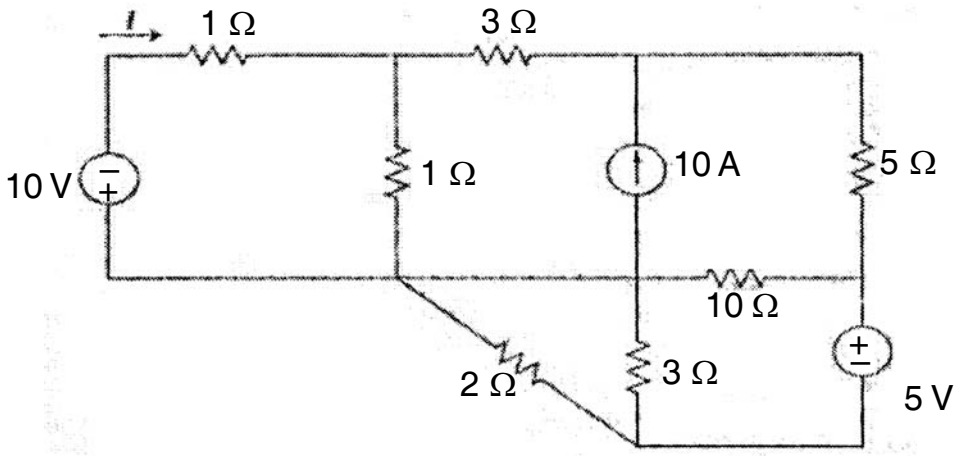


Fig. 2

b) Explain magnification in series RLC circuit. For the circuit shown in Fig. 3, at of 200 Hz, a maximum current of 0.7 A flows through the circuit and voltage across the capacitor is 200 V. Determine the circuit constants.

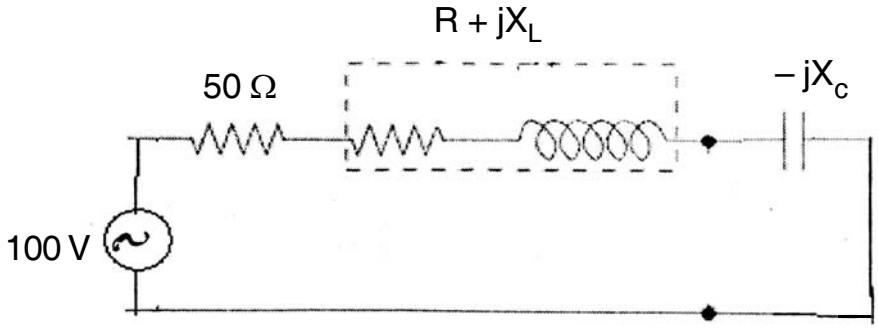


Fig. 3

c) Determine the Z parameters of the network shown in Fig. 4

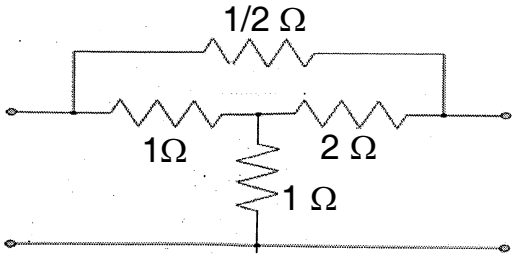


Fig. 4

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) For a T-section filter networks, prove that $Z_{OT} = \sqrt{\frac{Z_1^2}{4} + Z_1, Z_2}$.

b) Design a low pass π-section filter with a cut off frequency of 2 kHz with a terminated design impedance of 500 ohm.

c) Explain concept of poles and zeros with an example.

d) Explain DC response of series RL circuit.

e) For the network shown in Fig. 5, determine the transfer functions $G_{21}(s)$ and $Z_{21}(s)$.

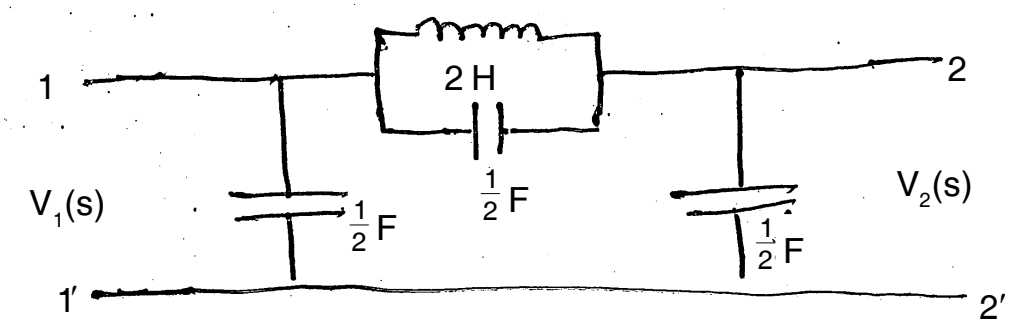


Fig. 5

5. Answer **any two** : **(6×2=12)**

a) Derive the designing equations for L_1, C_1, L_2 and C_2 of band pass filter.

b) What is a Routh criterion ? Apply the Routh criterion to the given polynomial and determine number of roots.

i) With positive real parts

ii) With zero real parts

iii) With negative real parts

$Q(s) = s^4 + 4s^3 + 8s^2 + 12s + 15$

c) Explain DC response of series RLC circuit.

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SLR-VB – 129

Seat No.	

Set **Q**

S.E. (Electronics) (Part – I) (CGPA) Examination, 2017
NETWORK THEORY AND ANALYSIS

Day and Date : Saturday, 6-5-2017 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.*
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*3) Figures to the **right** indicate **full** marks.*
*4) Assume suitable data **whenever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes

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

1) The system is said to be stable, if and only if
   a) all the poles lie on right half of the s-plane
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   c) all the poles lie on imaginary axis of the s-plane
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2) In a certain high-pass filter, fc = 5 kHz. Its pass band is
   a) 0 Hz to 5 kHz b) 5 kHz to infinity
   c) 5 kHz 10 kHz d) Can't say

3) The function is said to be having simple poles and zeros only if
   a) The poles are not repeated
   b) The zeros are not repeated
   c) The poles and zeros are not repeated
   d) None of the above

4) Inductor does not allow sudden changes
   a) in current b) in voltage
   c) both (a) and (b) d) none of the above

5) The time constant of series RL circuit is
   a) LR b) L/R c) R/I d) $e^{-R/L}$

P.T.O.

6) Parallel connection of LPF with cutofff frequency f_1 and HPF with cutoff frequency f_2 gives band stop filter if
   a) $F_1 < f_2$ b) $f_1 > f_2$ c) $f_1 = f_2$ d) none of the above

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   a) It increases b) It decreases
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11) In a series RLC with L = 15 H, C = 0,015 μ F and R = 80 phm, what is the impedance at the resonant frequency ?
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14) Which parameters are widely used in transmission theory ?
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SLR-VB – 129

Seat No.	

S.E. (Electronics) (Part – I) (CGPA) Examination, 2017
NETWORK THEORY AND ANALYSIS

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

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) Assume suitable data ***whenever*** *necessary.*

SECTION – I

2. Answer **any four** : **(4×4=16)**

a) Find Thevenin's equivalent circuit for the circuit shown in Fig. 1

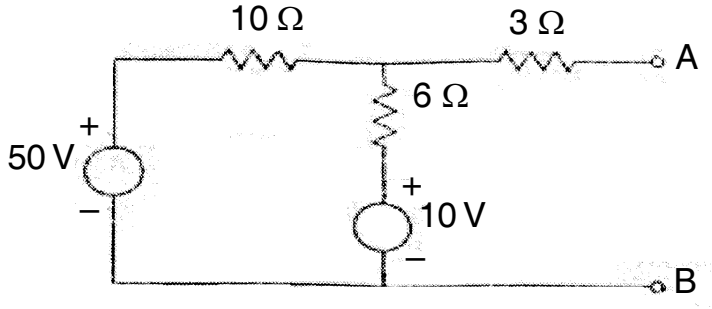

Fig. 1

b) State and prove maximum power transfer theorem.

c) Find driving point impedance in terms of Z parameters at the input port of a load terminated network.

d) A series RLC circuit with R = 50 ohm, L = 0.5 H, and C = 20 μ F and applied voltage is of 20 V. Determine the resonant frequency and voltage across the capacitor at resonance.

e) Derive the equation for resonant frequency for a Tank circuit.

3. Answer **any two** : **(6×2=12)**

a) Determine the current I shown in Fig. 2 by using superposition theorem.

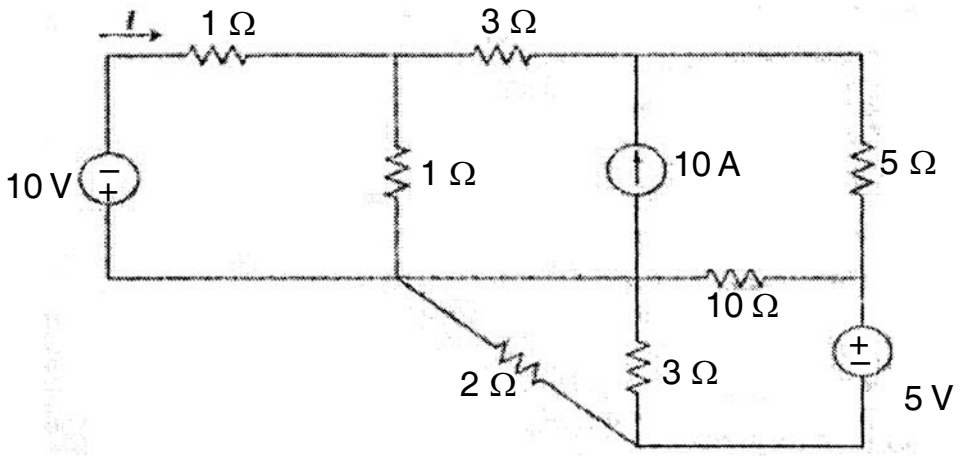

Fig. 2

b) Explain magnification in series RLC circuit. For the circuit shown in Fig. 3, at of 200 Hz, a maximum current of 0.7 A flows through the circuit and voltage across the capacitor is 200 V. Determine the circuit constants.

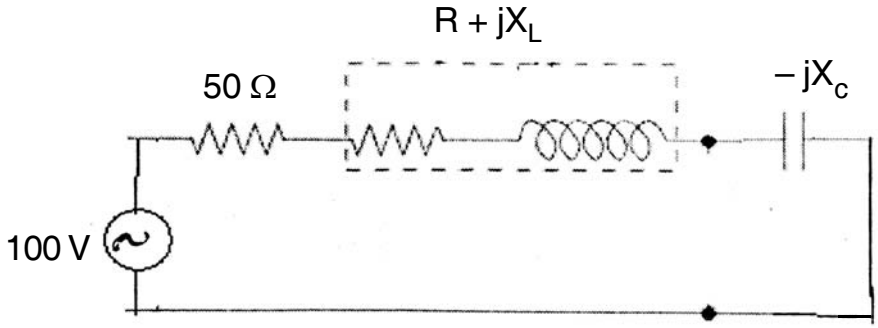

Fig. 3

c) Determine the Z parameters of the network shown in Fig. 4

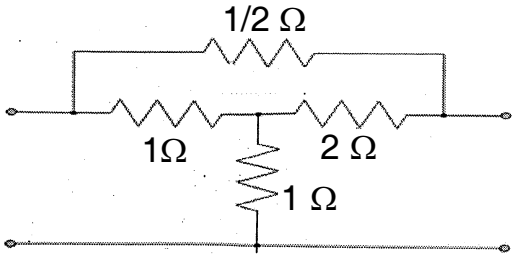

Fig. 4

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) For a T-section filter networks, prove that $Z_{OT} = \sqrt{\frac{Z_1^2}{4} + Z_1, Z_2}$.

b) Design a low pass π-section filter with a cut off frequency of 2 kHz with a terminated design impedance of 500 ohm.

c) Explain concept of poles and zeros with an example.

d) Explain DC response of series RL circuit.

e) For the network shown in Fig. 5, determine the transfer functions $G_{21}(s)$ and $Z_{21}(s)$.

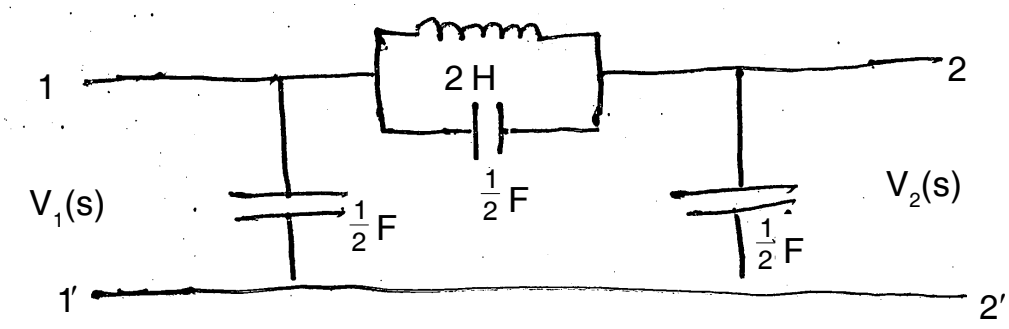

Fig. 5

5. Answer **any two** : **(6×2=12)**

a) Derive the designing equations for L_1, C_1, L_2 and C_2 of band pass filter.

b) What is a Routh criterion ? Apply the Routh criterion to the given polynomial and determine number of roots.

i) With positive real parts

ii) With zero real parts

iii) With negative real parts

$Q(s) = s^4 + 4s^3 + 8s^2 + 12s + 15$

c) Explain DC response of series RLC circuit.

SLR-VB – 129

Seat No.	

Set R

S.E. (Electronics) (Part – I) (CGPA) Examination, 2017
NETWORK THEORY AND ANALYSIS

Day and Date : Saturday, 6-5-2017 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.***
*3) Figures to the **right** indicate **full** marks.*
*4) Assume suitable data **whenever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes

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

1) In a parallel resonance circuit, why does the current lag behind the source voltage at frequencies below resonance ?
   a) Because the circuit is predominantly resistive
   b) Because the circuit is predominantly inductive
   c) Because the circuit is predominantly capacitive
   d) None of the above

2) Two port network are connected in cascade, the combination is to be represented as a single two port network, the parameters of the network are obtained by multiplying the individuals
   a) Z parameter matrix b) H parameter matrix
   c) Y parameter matrix d) Transmission parameter matrix

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

4) The system is said to be stable, if and only if
   a) all the poles lie on right half of the s-plane
   b) some poles lie on right half of the s-palne
   c) all the poles lie on imaginary axis of the s-plane
   d) all the poles lie on left half of the s-plane

5) In a certain high-pass filter, fc = 5 kHz. Its pass band is
   a) 0 Hz to 5 kHz
   b) 5 kHz to infinity
   c) 5 kHz 10 kHz
   d) Can't say

6) The function is said to be having simple poles and zeros only if
   a) The poles are not repeated
   b) The zeros are not repeated
   c) The poles and zeros are not repeated
   d) None of the above

7) Inductor does not allow sudden changes
   a) in current
   b) in voltage
   c) both (a) and (b)
   d) none of the above

8) The time constant of series RL circuit is
   a) LR
   b) L/R
   c) R/I
   d) $e^{-R/L}$

9) Parallel connection of LPF with cutofff frequency f_1 and HPF with cutoff frequency f_2 gives band stop filter if
   a) $F_1 < f_2$
   b) $f_1 > f_2$
   c) $f_1 = f_2$
   d) none of the above

10) Attenuation of 1 Neper = _____ dB.
   a) 6.868
   b) 8.886
   c) 6.686
   d) 8.686

11) One of the following laws of electrical n/ws is used in node analysis of the n/w
   a) KVL
   b) KCL
   c) Faradays law
   d) Ohms law

12) In applying the superposition theorem
   a) the sources are considered one at a time with all others replaced by their internal impedance
   b) all sources are considered independently
   c) all sources are considered simultaneously
   d) none of the above

13) In a series RLC circuit, if C is increased what happens to the resonant frequency ?
   a) It increases
   b) It decreases
   c) It remains the same
   d) It is zero

14) In a series RLC with L = 15 H, C = 0,015 μF and R = 80 phm, what is the impedance at the resonant frequency ?
   a) (15 mH) ω
   b) (0.015 F) ω
   c) 80 ohm
   d) 80 mho

_____

SLR-VB – 129

Seat No.	

S.E. (Electronics) (Part – I) (CGPA) Examination, 2017
NETWORK THEORY AND ANALYSIS

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

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) Assume suitable data ***whenever*** *necessary.*

SECTION – I

2. Answer **any four** : **(4×4=16)**

a) Find Thevenin's equivalent circuit for the circuit shown in Fig. 1

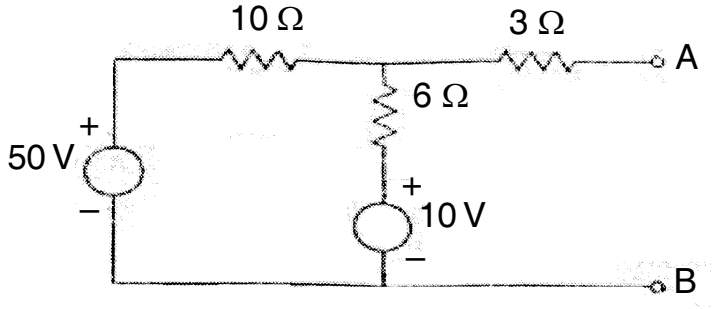

Fig. 1

b) State and prove maximum power transfer theorem.

c) Find driving point impedance in terms of Z parameters at the input port of a load terminated network.

d) A series RLC circuit with R = 50 ohm, L = 0.5 H, and C = 20 μ F and applied voltage is of 20 V. Determine the resonant frequency and voltage across the capacitor at resonance.

e) Derive the equation for resonant frequency for a Tank circuit.

3. Answer **any two** : **(6×2=12)**

a) Determine the current I shown in Fig. 2 by using superposition theorem.

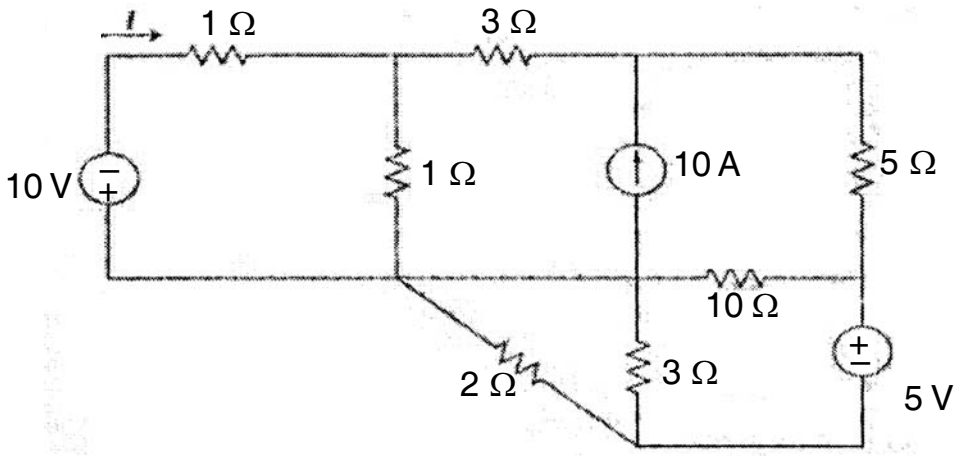

Fig. 2

b) Explain magnification in series RLC circuit. For the circuit shown in Fig. 3, at of 200 Hz, a maximum current of 0.7 A flows through the circuit and voltage across the capacitor is 200 V. Determine the circuit constants.

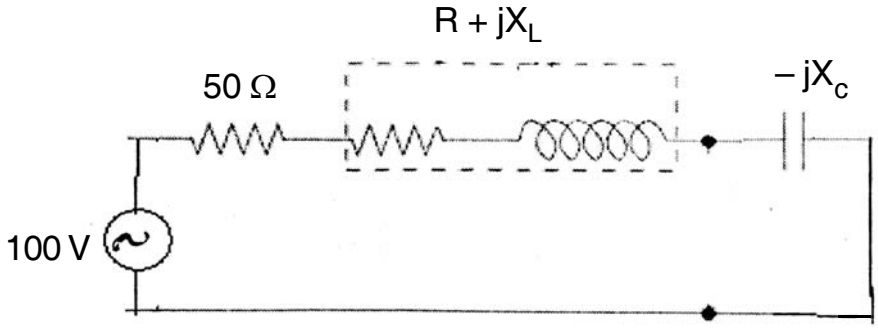

Fig. 3

c) Determine the Z parameters of the network shown in Fig. 4

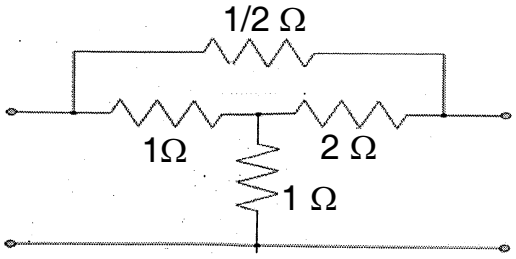

Fig. 4

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) For a T-section filter networks, prove that $Z_{OT} = \sqrt{\frac{Z_1^2}{4} + Z_1, Z_2}$.

b) Design a low pass π-section filter with a cut off frequency of 2 kHz with a terminated design impedance of 500 ohm.

c) Explain concept of poles and zeros with an example.

d) Explain DC response of series RL circuit.

e) For the network shown in Fig. 5, determine the transfer functions $G_{21}(s)$ and $Z_{21}(s)$.

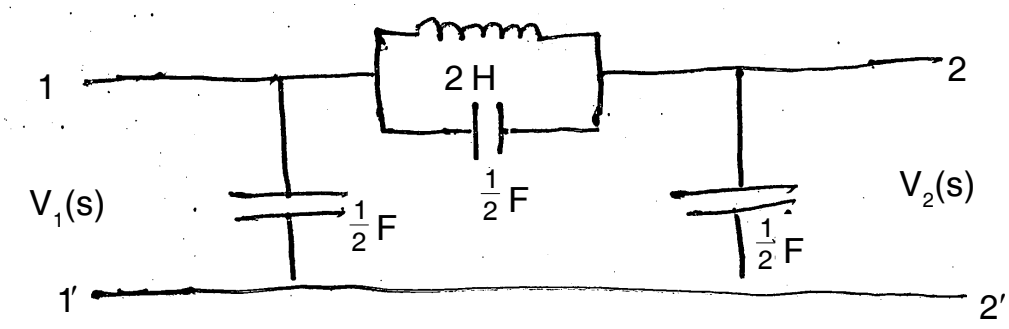

Fig. 5

5. Answer **any two** : **(6×2=12)**

a) Derive the designing equations for L_1, C_1, L_2 and C_2 of band pass filter.

b) What is a Routh criterion ? Apply the Routh criterion to the given polynomial and determine number of roots.

i) With positive real parts

ii) With zero real parts

iii) With negative real parts

$Q(s) = s^4 + 4s^3 + 8s^2 + 12s + 15$

c) Explain DC response of series RLC circuit.

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SLR-VB – 129

Seat No.	

Set **S**

S.E. (Electronics) (Part – I) (CGPA) Examination, 2017
NETWORK THEORY AND ANALYSIS

Day and Date : Saturday, 6-5-2017 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.***
*3) Figures to the **right** indicate **full** marks.*
*4) Assume suitable data **whenever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes

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

1) The function is said to be having simple poles and zeros only if
   a) The poles are not repeated
   b) The zeros are not repeated
   c) The poles and zeros are not repeated
   d) None of the above

2) Inductor does not allow sudden changes
   a) in current b) in voltage
   c) both (a) and (b) d) none of the above

3) The time constant of series RL circuit is
   a) LR b) L/R c) R/I d) $e^{-R/L}$

4) Parallel connection of LPF with cutofff frequency f_1 and HPF with cutoff frequency f_2 gives band stop filter if
   a) $F_1 < f_2$ b) $f_1 > f_2$ c) $f_1 = f_2$ d) none of the above

5) Attenuation of 1 Neper = _____ dB.
   a) 6.868 b) 8.886 c) 6.686 d) 8.686

6) One of the following laws of electrical n/ws is used in node analysis of the n/w
   a) KVL b) KCL c) Faradays law d) Ohms law

7) In applying the superposition theorem
   a) the sources are considered one at a time with all others replaced by their internal impedance
   b) all sources are considered independently
   c) all sources are considered simultaneously
   d) none of the above

8) In a series RLC circuit, if C is increased what happens to the resonant frequency ?
   a) It increases
   b) It decreases
   c) It remains the same
   d) It is zero

9) In a series RLC with L = 15 H, C = 0,015 μ F and R = 80 phm, what is the impedance at the resonant frequency ?
   a) (15 mH) ω
   b) (0.015 F) ω
   c) 80 ohm
   d) 80 mho

10) In a parallel resonance circuit, why does the current lag behind the source voltage at frequencies below resonance ?
   a) Because the circuit is predominantly resistive
   b) Because the circuit is predominantly inductive
   c) Because the circuit is predominantly capacitive
   d) None of the above

11) Two port network are connected in cascade, the combination is to be represented as a single two port network, the parameters of the network are obtained by multiplying the individuals
   a) Z parameter matrix
   b) H parameter matrix
   c) Y parameter matrix
   d) Transmission parameter matrix

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

13) The system is said to be stable, if and only if
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   b) some poles lie on right half of the s-palne
   c) all the poles lie on imaginary axis of the s-plane
   d) all the poles lie on left half of the s-plane

14) In a certain high-pass filter, fc = 5 kHz. Its pass band is
   a) 0 Hz to 5 kHz
   b) 5 kHz to infinity
   c) 5 kHz 10 kHz
   d) Can't say

SLR-VB – 129

Seat No.	

S.E. (Electronics) (Part – I) (CGPA) Examination, 2017
NETWORK THEORY AND ANALYSIS

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

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) Assume suitable data ***whenever*** *necessary.*

SECTION – I

2. Answer **any four** : **(4×4=16)**

a) Find Thevenin's equivalent circuit for the circuit shown in Fig. 1

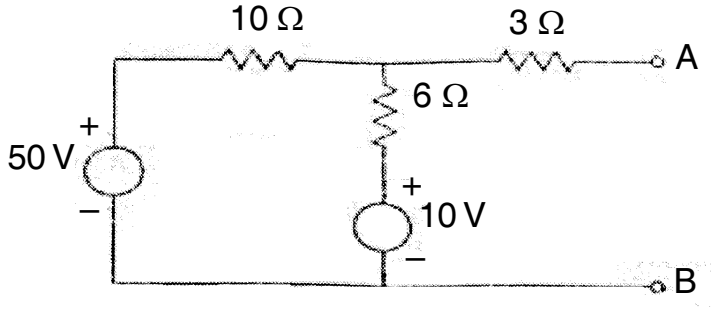

Fig. 1

b) State and prove maximum power transfer theorem.

c) Find driving point impedance in terms of Z parameters at the input port of a load terminated network.

d) A series RLC circuit with R = 50 ohm, L = 0.5 H, and C = 20 μ F and applied voltage is of 20 V. Determine the resonant frequency and voltage across the capacitor at resonance.

e) Derive the equation for resonant frequency for a Tank circuit.

3. Answer **any two** : **(6×2=12)**

a) Determine the current I shown in Fig. 2 by using superposition theorem.

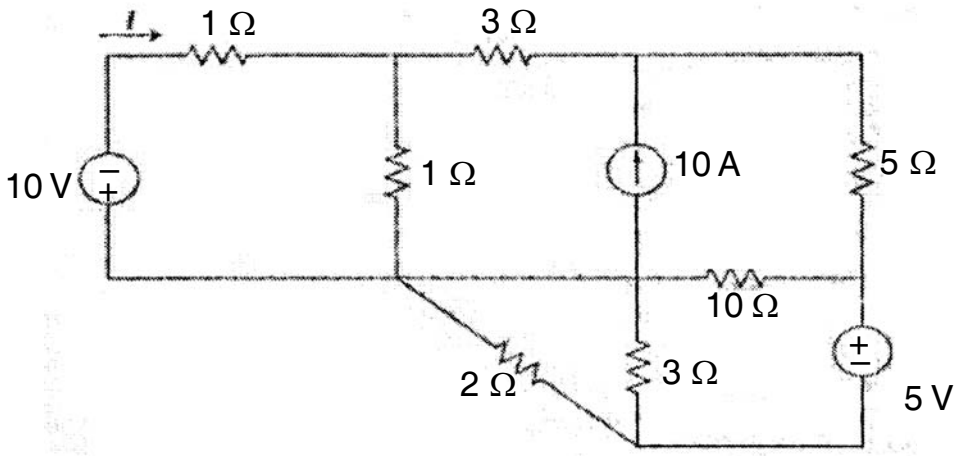

Fig. 2

b) Explain magnification in series RLC circuit. For the circuit shown in Fig. 3, at of 200 Hz, a maximum current of 0.7 A flows through the circuit and voltage across the capacitor is 200 V. Determine the circuit constants.

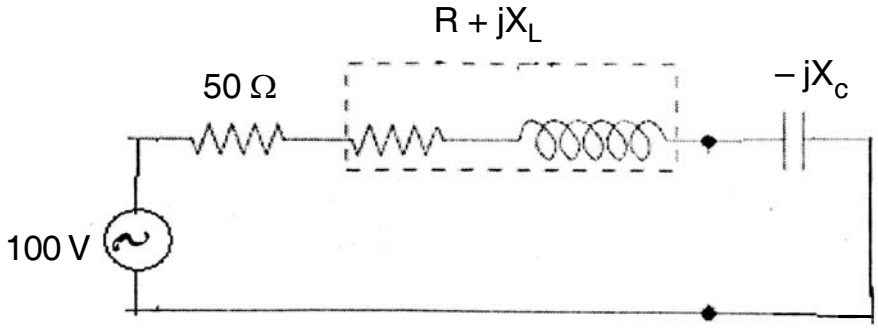

Fig. 3

c) Determine the Z parameters of the network shown in Fig. 4

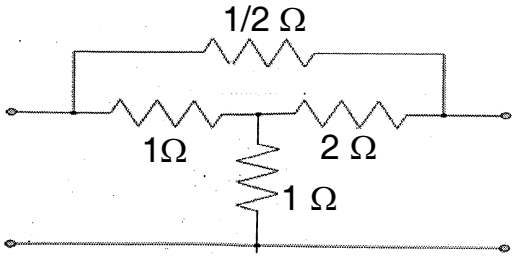

Fig. 4

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) For a T-section filter networks, prove that $Z_{OT} = \sqrt{\frac{Z_1^2}{4} + Z_1, Z_2}$.

b) Design a low pass π-section filter with a cut off frequency of 2 kHz with a terminated design impedance of 500 ohm.

c) Explain concept of poles and zeros with an example.

d) Explain DC response of series RL circuit.

e) For the network shown in Fig. 5, determine the transfer functions $G_{21}(s)$ and $Z_{21}(s)$.

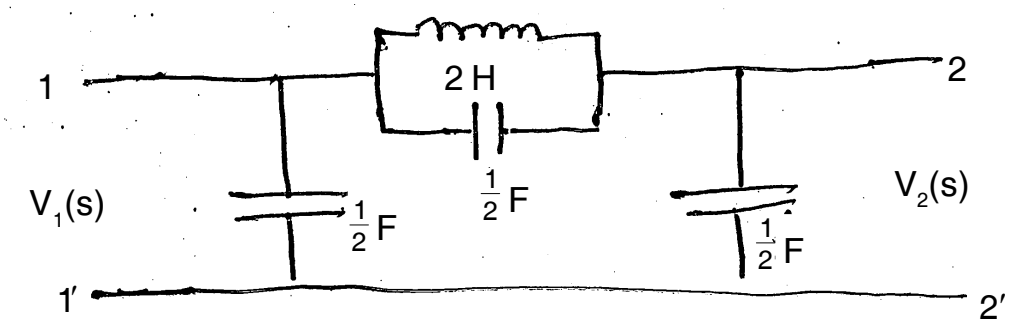

Fig. 5

5. Answer **any two** : **(6×2=12)**

a) Derive the designing equations for L_1, C_1, L_2 and C_2 of band pass filter.

b) What is a Routh criterion ? Apply the Routh criterion to the given polynomial and determine number of roots.

i) With positive real parts

ii) With zero real parts

iii) With negative real parts

$Q(s) = s^4 + 4s^3 + 8s^2 + 12s + 15$

c) Explain DC response of series RLC circuit.

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SLR-VB – 130

Seat No.	

Set **P**

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DIGITAL LOGIC DESIGN

Day and Date : Monday, 8-5-2017 Max. Marks : 70
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 **wherever** 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. **(1×14=14)**

1) In which code do the successive code characters differ in only one position ?
   a) Gray code b) XS-3 code c) 8421 code d) Hamming code

2) The logical expression F = AB + BC + AC is in _____
   a) SOP form b) POP form
   c) Standard SOP form d) Standard POS form

3) The code used for labeling cells of the K-map is _____
   a) Natural BCD b) Hexadecimal
   c) Gray d) Octal

4) Full adder can be realized using _____
   a) One half adder, two OR gates
   b) Two half adders, one OR gate
   c) Two half adders, two OR gates
   d) None of the above

5) A demultiplexer is used to _____
   a) Perform arithmetic division
   b) Select data from several inputs and route it to single output
   c) Steer the data from a single input to one of the many outputs
   d) Perform parity checking

6) The slowest logic family is _____
   a) TTL b) IIL c) MOS d) CMOS

7) In a K-map, if two cells are said to be adjacent, they are differentiated by _____ number of variables.
   a) 1 b) 2 c) n d) n^{-1}

8) Which of the following flip-flop is used as a latch ?
   a) J-K flip-flop b) Master-Slave J-K flip-flop
   c) T flip-flop d) D flip-flop

9) The race around condition occurs in a J-K flip-flop when _____
   a) both inputs are 0
   b) both inputs are 1
   c) the inputs are complementary
   d) any one of the above input combinations is present

10) How many states a 6 bit ripple counter can have ?
   a) 6 b) 12 c) 32 d) 64

11) For PAL design of logic circuit, a single lateral term _____
   a) requires an AND gate
   b) does not require AND gate
   c) requires an AND gate and one input for OR gate
   d) requires an inverter

12) A demultiplexer can be used to realize a _____
   a) Counter b) Shift register
   c) Combination circuit d) Display system

13) A flip-flop has two outputs which are _____
   a) Always zero b) Always complementary
   c) Always one d) In one of the above states

14) A PLA can be used _____
   a) to realize sequential logic b) to realize combinational logic
   c) as a memory d) none of these

_____

SLR-VB – 130

Seat No.	

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DIGITAL LOGIC DESIGN

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

SECTION – I

2. Attempt **any four**. **(4×4=16)**

a) What is a hamming code ? What is the limitation of the hamming code when it comes to detection and correction of bit errors ? Write the humming code for data $(1000)_2$.

b) Subtract $(0101)_2$ from $(1000)_2$ using r's complement and (r-1)'s complement arithmetic.

c) Optimize the following Boolean functions by means of a k-map.

$F(W, X, Y, Z) = \sum m\ (1, 4, 5, 10, 11, 13, 15)$

d) Prove that a full adder can be designed using two half-adders and one OR gate.

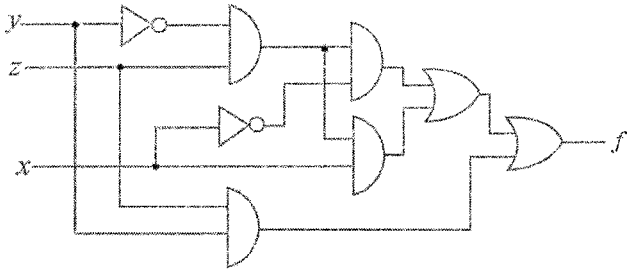
e) Design an 8 : 1 multiplexer using only 2 : 1 multiplexers. Explain the operation with truth table.

3. Attempt **any two**. **(6×2=12)**

a) Design a combinational circuit with three inputs and one output using NAND gate circuits. The output is '1' when the binary value of the inputs is large than 2. The output is '0' otherwise.

b) Briefly describe propagation delay, power dissipation, speed-power product, fan-in, fan-out and noise margin parameters, with particular reference to their significance as regards the suitability of the logic family for a given application.

c) Consider the combinational circuit shown. Analyze the circuit to obtain the simplified Boolean expressions for output f in terms of the input variables.



SECTION – II

4. Attempt **any four**. **(4×4=16)**

a) Construct a SR flip-flop using NAND gates. Tabulate the characteristic table and derive the characteristic equation for SR flip-flop.

b) Implement the Boolean function F(x, y) = $\sum$m(0, 3) using PLA.

c) What are different types of shift register ? Explain PISO shift register.

d) Explain a 4 bit twisted ring counter using D flip-flop with neat sketch. What is the modulus of this counter ?

e) Distinguish between a Programmable Logic Array (PLA) device and a Programmable Array Logic (PAL) device in terms of architecture and capability to implement Boolean functions.

5. Attempt **any two**. **(6×2=12)**

a) A toggle (T) flip-flop has two operations no change and complement, when input T is '0' and '1' respectively. Design a T flip-flop using JK flip-flop. Also derive the characteristic equation, tabulate the characteristic table and the excitation table for the T flip-flop.

b) Design a BCD synchronous counter using JK flip-flop. Draw neat circuit diagram and waveforms.

c) Explain Melay machine with example. Also compare Moore and Mealy machine.

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SLR-VB – 130

Seat No.	

Set **Q**

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DIGITAL LOGIC DESIGN

Day and Date : Monday, 8-5-2017 Max. 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. **(1×14=14)**

1) Which of the following flip-flop is used as a latch ?
   a) J-K flip-flop b) Master-Slave J-K flip-flop
   c) T flip-flop d) D flip-flop

2) The race around condition occurs in a J-K flip-flop when _____
   a) both inputs are 0
   b) both inputs are 1
   c) the inputs are complementary
   d) any one of the above input combinations is present

3) How many states a 6 bit ripple counter can have ?
   a) 6 b) 12 c) 32 d) 64

4) For PAL design of logic circuit, a single lateral term _____
   a) requires an AND gate
   b) does not require AND gate
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5) A demultiplexer can be used to realize a _____
   a) Counter b) Shift register
   c) Combination circuit d) Display system
6) A flip-flop has two outputs which are _____
   a) Always zero b) Always complementary
   c) Always one d) In one of the above states
7) A PLA can be used _____
   a) to realize sequential logic b) to realize combinational logic
   c) as a memory d) none of these
8) In which code do the successive code characters differ in only one position ?
   a) Gray code b) XS-3 code c) 8421 code d) Hamming code
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10) The code used for labeling cells of the K-map is _____
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11) Full adder can be realized using _____
   a) One half adder, two OR gates
   b) Two half adders, one OR gate
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12) A demultiplexer is used to _____
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   b) Select data from several inputs and route it to single output
   c) Steer the data from a single input to one of the many outputs
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13) The slowest logic family is _____
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14) In a K-map, if two cells are said to be adjacent, they are differentiated by _____ number of variables.
   a) 1 b) 2 c) n d) n^{-1}

_____

SLR-VB – 130

Seat No.	

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DIGITAL LOGIC DESIGN

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**.*
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SECTION – I

2. Attempt **any four**. **(4×4=16)**

a) What is a hamming code ? What is the limitation of the hamming code when it comes to detection and correction of bit errors ? Write the humming code for data $(1000)_2$.

b) Subtract $(0101)_2$ from $(1000)_2$ using r's complement and (r-1)'s complement arithmetic.

c) Optimize the following Boolean functions by means of a k-map.

$F(W, X, Y, Z) = \sum m\ (1, 4, 5, 10, 11, 13, 15)$

d) Prove that a full adder can be designed using two half-adders and one OR gate.

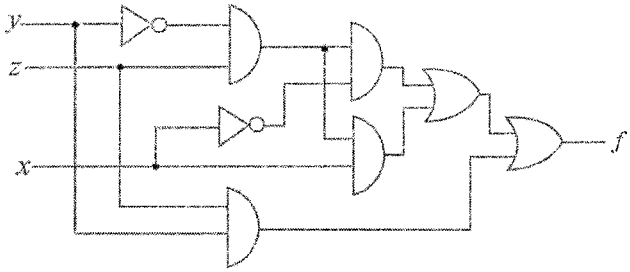
e) Design an 8 : 1 multiplexer using only 2 : 1 multiplexers. Explain the operation with truth table.

3. Attempt **any two**. **(6×2=12)**

a) Design a combinational circuit with three inputs and one output using NAND gate circuits. The output is '1' when the binary value of the inputs is large than 2. The output is '0' otherwise.

b) Briefly describe propagation delay, power dissipation, speed-power product, fan-in, fan-out and noise margin parameters, with particular reference to their significance as regards the suitability of the logic family for a given application.

c) Consider the combinational circuit shown. Analyze the circuit to obtain the simplified Boolean expressions for output f in terms of the input variables.



SECTION – II

4. Attempt **any four**. **(4×4=16)**

a) Construct a SR flip-flop using NAND gates. Tabulate the characteristic table and derive the characteristic equation for SR flip-flop.

b) Implement the Boolean function F(x, y) = $\sum$m(0, 3) using PLA.

c) What are different types of shift register ? Explain PISO shift register.

d) Explain a 4 bit twisted ring counter using D flip-flop with neat sketch. What is the modulus of this counter ?

e) Distinguish between a Programmable Logic Array (PLA) device and a Programmable Array Logic (PAL) device in terms of architecture and capability to implement Boolean functions.

5. Attempt **any two**. **(6×2=12)**

a) A toggle (T) flip-flop has two operations no change and complement, when input T is '0' and '1' respectively. Design a T flip-flop using JK flip-flop. Also derive the characteristic equation, tabulate the characteristic table and the excitation table for the T flip-flop.

b) Design a BCD synchronous counter using JK flip-flop. Draw neat circuit diagram and waveforms.

c) Explain Melay machine with example. Also compare Moore and Mealy machine.

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SLR-VB – 130

Seat No.	

Set **R**

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DIGITAL LOGIC DESIGN

Day and Date : Monday, 8-5-2017 Max. Marks : 70
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 **wherever** 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. **(1×14=14)**

1) A demultiplexer is used to _____
   a) Perform arithmetic division
   b) Select data from several inputs and route it to single output
   c) Steer the data from a single input to one of the many outputs
   d) Perform parity checking

2) The slowest logic family is _____
   a) TTL b) IIL c) MOS d) CMOS

3) In a K-map, if two cells are said to be adjacent, they are differentiated by _____ number of variables.
   a) 1 b) 2 c) n d) n^{-1}

4) Which of the following flip-flop is used as a latch ?
   a) J-K flip-flop b) Master-Slave J-K flip-flop
   c) T flip-flop d) D flip-flop

5) The race around condition occurs in a J-K flip-flop when _____
   a) both inputs are 0
   b) both inputs are 1
   c) the inputs are complementary
   d) any one of the above input combinations is present
6) How many states a 6 bit ripple counter can have ?
   a) 6 b) 12 c) 32 d) 64
7) For PAL design of logic circuit, a single lateral term _____
   a) requires an AND gate
   b) does not require AND gate
   c) requires an AND gate and one input for OR gate
   d) requires an inverter
8) A demultiplexer can be used to realize a _____
   a) Counter b) Shift register
   c) Combination circuit d) Display system
9) A flip-flop has two outputs which are _____
   a) Always zero b) Always complementary
   c) Always one d) In one of the above states
10) A PLA can be used _____
   a) to realize sequential logic b) to realize combinational logic
   c) as a memory d) none of these
11) In which code do the successive code characters differ in only one position ?
   a) Gray code b) XS-3 code c) 8421 code d) Hamming code
12) The logical expression F = AB + BC + AC is in _____
   a) SOP form b) POP form
   c) Standard SOP form d) Standard POS form
13) The code used for labeling cells of the K-map is _____
   a) Natural BCD b) Hexadecimal
   c) Gray d) Octal
14) Full adder can be realized using _____
   a) One half adder, two OR gates
   b) Two half adders, one OR gate
   c) Two half adders, two OR gates
   d) None of the above

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SLR-VB – 130

Seat No.	

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DIGITAL LOGIC DESIGN

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

SECTION – I

2. Attempt **any four**. **(4×4=16)**

a) What is a hamming code ? What is the limitation of the hamming code when it comes to detection and correction of bit errors ? Write the humming code for data $(1000)_2$.

b) Subtract $(0101)_2$ from $(1000)_2$ using r's complement and (r-1)'s complement arithmetic.

c) Optimize the following Boolean functions by means of a k-map.

$F(W, X, Y, Z) = \sum m\ (1, 4, 5, 10, 11, 13, 15)$

d) Prove that a full adder can be designed using two half-adders and one OR gate.

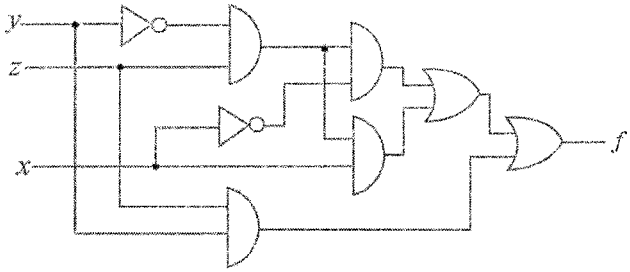
e) Design an 8 : 1 multiplexer using only 2 : 1 multiplexers. Explain the operation with truth table.

3. Attempt **any two**. **(6×2=12)**

a) Design a combinational circuit with three inputs and one output using NAND gate circuits. The output is '1' when the binary value of the inputs is large than 2. The output is '0' otherwise.

b) Briefly describe propagation delay, power dissipation, speed-power product, fan-in, fan-out and noise margin parameters, with particular reference to their significance as regards the suitability of the logic family for a given application.

c) Consider the combinational circuit shown. Analyze the circuit to obtain the simplified Boolean expressions for output f in terms of the input variables.



SECTION – II

4. Attempt **any four**. **(4×4=16)**

a) Construct a SR flip-flop using NAND gates. Tabulate the characteristic table and derive the characteristic equation for SR flip-flop.

b) Implement the Boolean function F(x, y) = $\sum$m(0, 3) using PLA.

c) What are different types of shift register ? Explain PISO shift register.

d) Explain a 4 bit twisted ring counter using D flip-flop with neat sketch. What is the modulus of this counter ?

e) Distinguish between a Programmable Logic Array (PLA) device and a Programmable Array Logic (PAL) device in terms of architecture and capability to implement Boolean functions.

5. Attempt **any two**. **(6×2=12)**

a) A toggle (T) flip-flop has two operations no change and complement, when input T is '0' and '1' respectively. Design a T flip-flop using JK flip-flop. Also derive the characteristic equation, tabulate the characteristic table and the excitation table for the T flip-flop.

b) Design a BCD synchronous counter using JK flip-flop. Draw neat circuit diagram and waveforms.

c) Explain Melay machine with example. Also compare Moore and Mealy machine.

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SLR-VB – 130

Seat No.	

Set **S**

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DIGITAL LOGIC DESIGN

Day and Date : Monday, 8-5-2017 Max. Marks : 70
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 **wherever** 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. **(1×14=14)**

1) How many states a 6 bit ripple counter can have ?
   a) 6 b) 12 c) 32 d) 64

2) For PAL design of logic circuit, a single lateral term _____
   a) requires an AND gate
   b) does not require AND gate
   c) requires an AND gate and one input for OR gate
   d) requires an inverter

3) A demultiplexer can be used to realize a _____
   a) Counter b) Shift register
   c) Combination circuit d) Display system

4) A flip-flop has two outputs which are _____
   a) Always zero b) Always complementary
   c) Always one d) In one of the above states

5) A PLA can be used _____
   a) to realize sequential logic b) to realize combinational logic
   c) as a memory d) none of these

6) In which code do the successive code characters differ in only one position ?
   a) Gray code b) XS-3 code c) 8421 code d) Hamming code

7) The logical expression F = AB + BC + AC is in _____
   a) SOP form b) POP form
   c) Standard SOP form d) Standard POS form

8) The code used for labeling cells of the K-map is _____
   a) Natural BCD b) Hexadecimal
   c) Gray d) Octal

9) Full adder can be realized using _____
   a) One half adder, two OR gates
   b) Two half adders, one OR gate
   c) Two half adders, two OR gates
   d) None of the above

10) A demultiplexer is used to _____
   a) Perform arithmetic division
   b) Select data from several inputs and route it to single output
   c) Steer the data from a single input to one of the many outputs
   d) Perform parity checking

11) The slowest logic family is _____
   a) TTL b) IIL c) MOS d) CMOS

12) In a K-map, if two cells are said to be adjacent, they are differentiated by _____ number of variables.
   a) 1 b) 2 c) n d) n^{-1}

13) Which of the following flip-flop is used as a latch ?
   a) J-K flip-flop b) Master-Slave J-K flip-flop
   c) T flip-flop d) D flip-flop

14) The race around condition occurs in a J-K flip-flop when _____
   a) both inputs are 0
   b) both inputs are 1
   c) the inputs are complementary
   d) any one of the above input combinations is present

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SLR-VB – 130

Seat No.	

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DIGITAL LOGIC DESIGN

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

SECTION – I

2. Attempt **any four**. **(4×4=16)**

a) What is a hamming code ? What is the limitation of the hamming code when it comes to detection and correction of bit errors ? Write the humming code for data $(1000)_2$.

b) Subtract $(0101)_2$ from $(1000)_2$ using r's complement and (r-1)'s complement arithmetic.

c) Optimize the following Boolean functions by means of a k-map.

$F(W, X, Y, Z) = \sum m\ (1, 4, 5, 10, 11, 13, 15)$

d) Prove that a full adder can be designed using two half-adders and one OR gate.

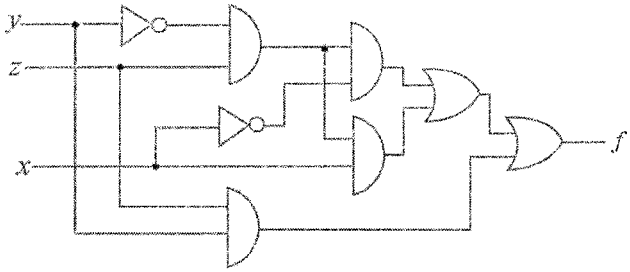
e) Design an 8 : 1 multiplexer using only 2 : 1 multiplexers. Explain the operation with truth table.

3. Attempt **any two**. **(6×2=12)**

a) Design a combinational circuit with three inputs and one output using NAND gate circuits. The output is '1' when the binary value of the inputs is large than 2. The output is '0' otherwise.

b) Briefly describe propagation delay, power dissipation, speed-power product, fan-in, fan-out and noise margin parameters, with particular reference to their significance as regards the suitability of the logic family for a given application.

c) Consider the combinational circuit shown. Analyze the circuit to obtain the simplified Boolean expressions for output f in terms of the input variables.



SECTION – II

4. Attempt **any four**. **(4×4=16)**

a) Construct a SR flip-flop using NAND gates. Tabulate the characteristic table and derive the characteristic equation for SR flip-flop.

b) Implement the Boolean function F(x, y) = $\sum$m(0, 3) using PLA.

c) What are different types of shift register ? Explain PISO shift register.

d) Explain a 4 bit twisted ring counter using D flip-flop with neat sketch. What is the modulus of this counter ?

e) Distinguish between a Programmable Logic Array (PLA) device and a Programmable Array Logic (PAL) device in terms of architecture and capability to implement Boolean functions.

5. Attempt **any two**. **(6×2=12)**

a) A toggle (T) flip-flop has two operations no change and complement, when input T is '0' and '1' respectively. Design a T flip-flop using JK flip-flop. Also derive the characteristic equation, tabulate the characteristic table and the excitation table for the T flip-flop.

b) Design a BCD synchronous counter using JK flip-flop. Draw neat circuit diagram and waveforms.

c) Explain Melay machine with example. Also compare Moore and Mealy machine.

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SLR-VB – 131

Seat No.	

Set **P**

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DATA STRUCTURES

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

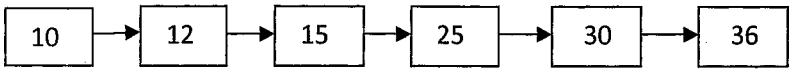
Duration : 30 Minutes Marks : 14

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

1) One difference between a queue and a stack is
   a) Queue require linked list, but stack do not
   b) Stack require linked list, but queue do not
   c) Queue use two ends of the structure, stack use only one
   d) Stack use two ends of the structure, queue use only one

2) User performs following operations on stack of size 5, then :
   push (1); pop ( ); push (2); push (3); pop ( ); push (2); pop ( ); pop ( ); push (4); pop ( ); pop ( ); push (5);
   Which of the following is correct statement for stack ?
   a) overflow occurs
   b) underflow occurs
   c) stack operations will be performed smoothly
   d) none of these

3) Consider the following linked list :



and following linked list representation :

```
struct node
{
   int data;
   struct node *next;
} *start = NULL;
```

What will be the value of following statement ?
start → next → next → next → data
a) 12 b) 30 c) 15 d) 25

4) The value of rear is increased by 1 when _____
   a) An element is deleted in a queue b) An element is traversed in a queue
   c) An element is added in a queue d) An element is merged in a queue

5) Any recursive process uses _____ data structure.
   a) trees b) graph c) stack d) queue

6) You are given pointers to first and last nodes of a singly linked list, which of the following operations are dependent on the length of the linked list ?
   a) delete the first element
   b) insert a new element as a first element
   c) delete the last element of the list
   d) add the new element at the end of the list

7) When does top value of stack change in insertion process ?
   a) before insertion b) after insertion
   c) at the time of insertion d) while checking overflow

8) The number of leaf nodes in a complete binary tree of depth d is
   a) 2^d b) $2^{(d+1)}-1$ c) $2^{(d-1)}-1$ d) 2^d+1

9) The average time required to perform a successful sequential search for an element in an array A (1:n) is given by
   a) (n+1)/2 b) $\log_2 n$ c) n(n+1)/2 d) n^2

10) A sort which iteratively passes through a list to exchange the first element with any element less than it and then repeats with a new first element is called
   a) insertion sort b) selection sort c) heap sort d) quick sort

11) To arrange a binary tree in ascending order we need
   a) postorder traversal b) inorder traversal
   c) preorder traversal d) none of these

12) A graph is said to be _____ if every node 'u' in G is adjacent to every other node 'v' in G.
   a) absolute b) entire c) inclusive d) complete

13) Which of the following is not a collision resolution method ?
   a) open addressing b) folding
   c) chaining d) rehashing

14) If the binary search algorithm determines that the search argument is in the lower half of the array, which of the following statements will set the appropriate variables to the appropriate value ?
   a) low = mid + 1 b) low = mid – 1 c) high = mid + 1 d) high = mid – 1

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SLR-VB – 131

Seat No.	

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DATA STRUCTURES

Day and Date : Tuesday, 9-5-2017 Marks : 56
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** : **(4×4=16)**
   1) What are linear and non-linear data structures ? Give two examples of each.
   2) Write and explain an algorithm to convert infix expression to postfix expression.
   3) Write a short note on priority queue.
   4) What is recursion ? Write a recursive program to find the multiplication of two natural numbers.
   5) Explain any one application of linked list with example.

3. Attempt **any two** : **(2×6=12)**
   1) Give the dynamic implementation of singly linked list in C language.
   2) Write a C program to implement stack using linked list.
   3) Write a C program to implement circular queue using array.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Explain any four types of tree with diagram.
   2) Justify how binary search technique is more efficient than sequential search.
   3) Write a short note on threaded binary trees.
   4) What is merge sort ? Merge the following two arrays using merge sort and show the intermediate steps :

      A = [11, 20, 35, 42] and B = [9, 22, 50]
   5) Explain the adjacency matrix representation for a graph.

5. Attempt **any two** : **(2×6=12)**

   1) What is a heap ? Show the steps to create a heap for the given data : 8, 20, 9, 4, 15, 10, 7, 22, 3, 12.

   2) What are hashing functions ? Explain the most commonly used hash functions.

   3) What are graph traversal methods ? Explain any one traversal method with flowchart.

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SLR-VB – 131

Seat No.	

Set Q

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DATA STRUCTURES

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) The number of leaf nodes in a complete binary tree of depth d is
a) 2^d b) $2^{(d+1)}-1$ c) $2^{(d-1)}-1$ d) 2^d+1

2) The average time required to perform a successful sequential search for an element in an array A (1:n) is given by
a) (n+1)/2 b) $\log_2 n$ c) n(n+1)/2 d) n^2

3) A sort which iteratively passes through a list to exchange the first element with any element less than it and then repeats with a new first element is called
a) insertion sort b) selection sort c) heap sort d) quick sort

4) To arrange a binary tree in ascending order we need
a) postorder traversal b) inorder traversal
c) preorder traversal d) none of these

5) A graph is said to be _____ if every node 'u' in G is adjacent to every other node 'v' in G.
a) absolute b) entire c) inclusive d) complete

6) Which of the following is not a collision resolution method ?
a) open addressing b) folding
c) chaining d) rehashing

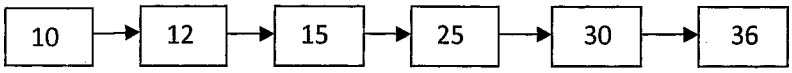
7) If the binary search algorithm determines that the search argument is in the lower half of the array, which of the following statements will set the appropriate variables to the appropriate value ?
a) low = mid + 1 b) low = mid – 1 c) high = mid + 1 d) high = mid – 1

P.T.O.

8) One difference between a queue and a stack is
   a) Queue require linked list, but stack do not
   b) Stack require linked list, but queue do not
   c) Queue use two ends of the structure, stack use only one
   d) Stack use two ends of the structure, queue use only one

9) User performs following operations on stack of size 5, then :
   push (1); pop ( ); push (2); push (3); pop ( ); push (2); pop ( ); pop ( ); push (4); pop ( ); pop ( ); push (5);
   Which of the following is correct statement for stack ?
   a) overflow occurs
   b) underflow occurs
   c) stack operations will be performed smoothly
   d) none of these

10) Consider the following linked list :



and following linked list representation :

```
struct node
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   int data;
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} *start = NULL;
```

What will be the value of following statement ?
start → next → next → next → data
a) 12 b) 30 c) 15 d) 25

11) The value of rear is increased by 1 when _____
   a) An element is deleted in a queue b) An element is traversed in a queue
   c) An element is added in a queue d) An element is merged in a queue

12) Any recursive process uses _____ data structure.
   a) trees b) graph c) stack d) queue

13) You are given pointers to first and last nodes of a singly linked list, which of the following operations are dependent on the length of the linked list ?
   a) delete the first element
   b) insert a new element as a first element
   c) delete the last element of the list
   d) add the new element at the end of the list

14) When does top value of stack change in insertion process ?
   a) before insertion b) after insertion
   c) at the time of insertion d) while checking overflow

_____

SLR-VB – 131

Seat No.	

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DATA STRUCTURES

Day and Date : Tuesday, 9-5-2017 Marks : 56
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** : **(4×4=16)**
   1) What are linear and non-linear data structures ? Give two examples of each.
   2) Write and explain an algorithm to convert infix expression to postfix expression.
   3) Write a short note on priority queue.
   4) What is recursion ? Write a recursive program to find the multiplication of two natural numbers.
   5) Explain any one application of linked list with example.

3. Attempt **any two** : **(2×6=12)**
   1) Give the dynamic implementation of singly linked list in C language.
   2) Write a C program to implement stack using linked list.
   3) Write a C program to implement circular queue using array.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Explain any four types of tree with diagram.
   2) Justify how binary search technique is more efficient than sequential search.
   3) Write a short note on threaded binary trees.
   4) What is merge sort ? Merge the following two arrays using merge sort and show the intermediate steps :

      A = [11, 20, 35, 42] and B = [9, 22, 50]
   5) Explain the adjacency matrix representation for a graph.

5. Attempt **any two** : **(2×6=12)**

   1) What is a heap ? Show the steps to create a heap for the given data : 8, 20, 9, 4, 15, 10, 7, 22, 3, 12.

   2) What are hashing functions ? Explain the most commonly used hash functions.

   3) What are graph traversal methods ? Explain any one traversal method with flowchart.

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SLR-VB – 131

Seat No.	

Set R

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DATA STRUCTURES

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) Any recursive process uses _____ data structure.
a) trees b) graph c) stack d) queue

2) You are given pointers to first and last nodes of a singly linked list, which of the following operations are dependent on the length of the linked list ?
a) delete the first element
b) insert a new element as a first element
c) delete the last element of the list
d) add the new element at the end of the list

3) When does top value of stack change in insertion process ?
a) before insertion b) after insertion
c) at the time of insertion d) while checking overflow

4) The number of leaf nodes in a complete binary tree of depth d is
a) 2^d b) $2^{(d+1)}-1$ c) $2^{(d-1)}-1$ d) 2^d+1

5) The average time required to perform a successful sequential search for an element in an array A (1:n) is given by
a) (n+1)/2 b) $\log_2 n$ c) n(n+1)/2 d) n^2

6) A sort which iteratively passes through a list to exchange the first element with any element less than it and then repeats with a new first element is called
a) insertion sort b) selection sort c) heap sort d) quick sort

7) To arrange a binary tree in ascending order we need
a) postorder traversal b) inorder traversal
c) preorder traversal d) none of these

P.T.O.

8) A graph is said to be _____ if every node 'u' in G is adjacent to every other node 'v' in G.
   a) absolute b) entire c) inclusive d) complete

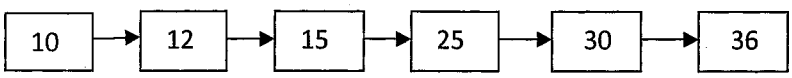
9) Which of the following is not a collision resolution method ?
   a) open addressing b) folding
   c) chaining d) rehashing

10) If the binary search algorithm determines that the search argument is in the lower half of the array, which of the following statements will set the appropriate variables to the appropriate value ?
   a) low = mid + 1 b) low = mid – 1 c) high = mid + 1 d) high = mid – 1

11) One difference between a queue and a stack is
   a) Queue require linked list, but stack do not
   b) Stack require linked list, but queue do not
   c) Queue use two ends of the structure, stack use only one
   d) Stack use two ends of the structure, queue use only one

12) User performs following operations on stack of size 5, then :
   push (1); pop ( ); push (2); push (3); pop ( ); push (2); pop ( ); pop ( ); push (4); pop ( ); pop ( ); push (5);
   Which of the following is correct statement for stack ?
   a) overflow occurs
   b) underflow occurs
   c) stack operations will be performed smoothly
   d) none of these

13) Consider the following linked list :



   and following linked list representation :

```
struct node
{
   int data;
   struct node *next;
} *start = NULL;
```

   What will be the value of following statement ?
   start → next → next → next → data
   a) 12 b) 30 c) 15 d) 25

14) The value of rear is increased by 1 when _____
   a) An element is deleted in a queue b) An element is traversed in a queue
   c) An element is added in a queue d) An element is merged in a queue

_____

SLR-VB – 131

Seat No.	

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DATA STRUCTURES

Day and Date : Tuesday, 9-5-2017 Marks : 56
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** : **(4×4=16)**
   1) What are linear and non-linear data structures ? Give two examples of each.
   2) Write and explain an algorithm to convert infix expression to postfix expression.
   3) Write a short note on priority queue.
   4) What is recursion ? Write a recursive program to find the multiplication of two natural numbers.
   5) Explain any one application of linked list with example.

3. Attempt **any two** : **(2×6=12)**
   1) Give the dynamic implementation of singly linked list in C language.
   2) Write a C program to implement stack using linked list.
   3) Write a C program to implement circular queue using array.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Explain any four types of tree with diagram.
   2) Justify how binary search technique is more efficient than sequential search.
   3) Write a short note on threaded binary trees.
   4) What is merge sort ? Merge the following two arrays using merge sort and show the intermediate steps :

      A = [11, 20, 35, 42] and B = [9, 22, 50]
   5) Explain the adjacency matrix representation for a graph.

Set R

5. Attempt **any two** : **(2×6=12)**

   1) What is a heap ? Show the steps to create a heap for the given data : 8, 20, 9, 4, 15, 10, 7, 22, 3, 12.

   2) What are hashing functions ? Explain the most commonly used hash functions.

   3) What are graph traversal methods ? Explain any one traversal method with flowchart.

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SLR-VB – 131

Seat No.	

Set S

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DATA STRUCTURES

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) A sort which iteratively passes through a list to exchange the first element with any element less than it and then repeats with a new first element is called
   a) insertion sort b) selection sort c) heap sort d) quick sort

2) To arrange a binary tree in ascending order we need
   a) postorder traversal b) inorder traversal
   c) preorder traversal d) none of these

3) A graph is said to be _____ if every node 'u' in G is adjacent to every other node 'v' in G.
   a) absolute b) entire c) inclusive d) complete

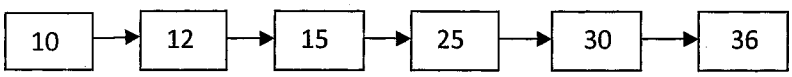
4) Which of the following is not a collision resolution method ?
   a) open addressing b) folding
   c) chaining d) rehashing

5) If the binary search algorithm determines that the search argument is in the lower half of the array, which of the following statements will set the appropriate variables to the appropriate value ?
   a) low = mid + 1 b) low = mid – 1 c) high = mid + 1 d) high = mid – 1

6) One difference between a queue and a stack is
   a) Queue require linked list, but stack do not
   b) Stack require linked list, but queue do not
   c) Queue use two ends of the structure, stack use only one
   d) Stack use two ends of the structure, queue use only one

7) User performs following operations on stack of size 5, then :
push (1); pop ( ); push (2); push (3); pop ( ); push (2); pop ( ); pop ( ); push (4); pop ( ); pop ( ); push (5);
Which of the following is correct statement for stack ?
a) overflow occurs
b) underflow occurs
c) stack operations will be performed smoothly
d) none of these

8) Consider the following linked list :



and following linked list representation :

```
struct node
{
   int data;
   struct node *next;
} *start = NULL;
```

What will be the value of following statement ?
start → next → next → next → data
a) 12 b) 30 c) 15 d) 25

9) The value of rear is increased by 1 when _____
a) An element is deleted in a queue b) An element is traversed in a queue
c) An element is added in a queue d) An element is merged in a queue

10) Any recursive process uses _____ data structure.
a) trees b) graph c) stack d) queue

11) You are given pointers to first and last nodes of a singly linked list, which of the following operations are dependent on the length of the linked list ?
a) delete the first element
b) insert a new element as a first element
c) delete the last element of the list
d) add the new element at the end of the list

12) When does top value of stack change in insertion process ?
a) before insertion b) after insertion
c) at the time of insertion d) while checking overflow

13) The number of leaf nodes in a complete binary tree of depth d is
a) 2^d b) $2^{(d+1)}-1$ c) $2^{(d-1)}-1$ d) 2^d+1

14) The average time required to perform a successful sequential search for an element in an array A (1:n) is given by
a) (n+1)/2 b) $\log_2 n$ c) n(n+1)/2 d) n^2

_____

SLR-VB – 131

Seat No.	

S.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
DATA STRUCTURES

Day and Date : Tuesday, 9-5-2017 Marks : 56
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** : **(4×4=16)**
   1) What are linear and non-linear data structures ? Give two examples of each.
   2) Write and explain an algorithm to convert infix expression to postfix expression.
   3) Write a short note on priority queue.
   4) What is recursion ? Write a recursive program to find the multiplication of two natural numbers.
   5) Explain any one application of linked list with example.

3. Attempt **any two** : **(2×6=12)**
   1) Give the dynamic implementation of singly linked list in C language.
   2) Write a C program to implement stack using linked list.
   3) Write a C program to implement circular queue using array.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Explain any four types of tree with diagram.
   2) Justify how binary search technique is more efficient than sequential search.
   3) Write a short note on threaded binary trees.
   4) What is merge sort ? Merge the following two arrays using merge sort and show the intermediate steps :

      A = [11, 20, 35, 42] and B = [9, 22, 50]
   5) Explain the adjacency matrix representation for a graph.

5. Attempt **any two** : **(2×6=12)**

   1) What is a heap ? Show the steps to create a heap for the given data : 8, 20, 9, 4, 15, 10, 7, 22, 3, 12.

   2) What are hashing functions ? Explain the most commonly used hash functions.

   3) What are graph traversal methods ? Explain any one traversal method with flowchart.

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SLR-VB – 132

Seat No.	

Set P

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRICAL MACHINES

Day and Date : Tuesday, 16-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

***Instructions** : 1) Figures to the **right** indicate **full** marks.*
*2) **Assume** suitable data **whenever** 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) In universal motor is designed to run on _____ supply.
a) dc b) ac
c) both dc and ac d) all answers are correct

2) The lagging power factor is due to reactive power drawn by _____ the load.
a) capacitive b) inductive
c) both type d) none of the above

3) The synchronous speed of 10 pole, 100 Hz frequency I.M. is _____ rpm.
a) 1000 b) 1300 c) 1200 d) 1500

4) According to the principle of operation of a three phase induction motor the air gap flux is
a) Φ_M b) $1.5\Phi_M$ c) $1.55\Phi_M$ d) $0.5\Phi_M$

5) _____ is the starter used for dc shunt motor.
a) 3-point starter b) DOL starter
c) 5-point starter d) none of the above

6) In T-T connection teaser transformer is having _____ % tapping on both primary and secondary winding.
a) 86.6 b) 50 c) 100 d) 76.8

P.T.O.

7) If W1 and W2 readings are positive and equal in magnitude then power factor is
   a) 0.95 b) 0.6 c) 1 d) 0.8

8) The rotor slots in three phase squirrel cage I.M. are kept _____
   a) skewed b) parallel
   c) twisted d) none of the above

9) The current drawn by a 120 V d.c. motor of armature resistance 1 ohm and back emf 110 V is
   a) 20 A b) 240 A c) 110 A d) 5 A

10) In a 3 ph. I.M., Ns is speed of
   a) rotor flux b) stator flux
   c) motor d) none of the above

11) HVDC transmission is advantageous in comparison with HVAC because
   a) dc is unidirectional
   b) dc is represented by polarities
   c) in dc magnitude is constant
   d) in dc minimum conductors are required

12) For dc shunt motor $T \alpha I_a$ because
   a) the supply voltage is constant b) field winding resistance is constant
   c) the speed is constant d) the no load current is constant

13) Brake load test is
   a) no load test b) O.C. test
   c) S.C. test d) None of the above

14) For the application traction following motor is suitable
   a) dc series motor
   b) synchronous motor
   c) squirrel cage 3 phase induction motor
   d) None of the above

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SLR-VB – 132

Seat No.	

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRICAL MACHINES

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* ***whenever*** *necessary.*

SECTION – I

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

a) What is electrical braking of d.c. motor ? With neat diagram clarify one breaking method used for dc shunt motor.

b) Two wattmeter connected to a three phase induction motor indicate the total input power to be 12 KW the power factor is 0.6. Determine the readings of two wattmeter.

c) Derive the relation for power factor angle in terms of two wattmeter reading.

d) Describe important features of brushless dc motor.

e) A 480 (Volt) 6-pole d.c. motor has lap connected 864 conductors on its armature and its resistance is 0.2 Ω. The motor takes current of 110 (Amp). Find its back emf and speed if it has a flux per pole of 0.05 (mwb).

3. Attempt **any two** : **(6×2=12)**

a) Which speed control method is suitable for controlling below normal value for dc series motor ? With neat diagram elaborate the same.

b) A 220 V dc shunt motor runs at 500 rpm when takes armature current of 50A. Calculate the speed if the torque is doubled. Take R_a = 0.2 Ω and assume flux remains unchanged.

c) Draw neat single line diagram and explain electrical power system.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

   a) Why rotor of three phase induction motor rotates ? Define the term slip and slip speed.

   b) Elaborate in detail advantages and disadvantages of individual drive.

   c) A three phase, 50 (Hz) transformer has delta connected primary and star connected secondary, the line voltages being 22 (KV) and 400 (V) respectively. The primary line current is 5 (Amp). Determine transformation ratio, primary and secondary phase current.

   d) Explain the concept of power factor and explain the cause of low power factor.

   e) A 6 pole, 50 (Hz) three phase squirrel cage induction motor runs on no load at a speed 970 rpm. Calculate % slip and the frequency of rotor current.

5. Attempt **any two** : **(6×2=12)**

   a) A 50 Hz 8 pole induction motor has full load slip of 4%. The rotor resistance per phase is 0.01 Ω and stand still reactance per phase of 0.1 Ω. Find the relation of maximum torque to full load torque and the speed at which becomes torque maximum.

   b) Compare three phase transformer connection star-star with delta-delta connection.

   c) Why starter is necessary for starting of three phase induction motor ? With neat diagram explain star-delta starter.

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SLR-VB – 132

Seat No.	

Set Q

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRICAL MACHINES

Day and Date : Tuesday, 16-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

***Instructions** : 1) Figures to the **right** indicate **full** marks.*
*2) **Assume** suitable data **whenever** 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 rotor slots in three phase squirrel cage I.M. are kept _____
   a) skewed b) parallel
   c) twisted d) none of the above

2) The current drawn by a 120 V d.c. motor of armature resistance 1 ohm and back emf 110 V is
   a) 20 A b) 240 A c) 110 A d) 5 A

3) In a 3 ph. I.M., Ns is speed of
   a) rotor flux b) stator flux
   c) motor d) none of the above

4) HVDC transmission is advantageous in comparison with HVAC because
   a) dc is unidirectional
   b) dc is represented by polarities
   c) in dc magnitude is constant
   d) in dc minimum conductors are required

5) For dc shunt motor $T \alpha I_a$ because
   a) the supply voltage is constant
   b) field winding resistance is constant
   c) the speed is constant
   d) the no load current is constant

P.T.O.

6) Brake load test is
   a) no load test
   b) O.C. test
   c) S.C. test
   d) None of the above

7) For the application traction following motor is suitable
   a) dc series motor
   b) synchronous motor
   c) squirrel cage 3 phase induction motor
   d) None of the above

8) In universal motor is designed to run on _____ supply.
   a) dc
   b) ac
   c) both dc and ac
   d) all answers are correct

9) The lagging power factor is due to reactive power drawn by _____ the load.
   a) capacitive
   b) inductive
   c) both type
   d) none of the above

10) The synchronous speed of 10 pole, 100 Hz frequency I.M. is _____ rpm.
   a) 1000 b) 1300 c) 1200 d) 1500

11) According to the principle of operation of a three phase induction motor the air gap flux is
   a) Φ_M b) $1.5\Phi_M$ c) $1.55\Phi_M$ d) $0.5\Phi_M$

12) _____ is the starter used for dc shunt motor.
   a) 3-point starter
   b) DOL starter
   c) 5-point starter
   d) none of the above

13) In T-T connection teaser transformer is having _____ % tapping on both primary and secondary winding.
   a) 86.6 b) 50 c) 100 d) 76.8

14) If W1 and W2 readings are positive and equal in magnitude then power factor is
   a) 0.95 b) 0.6 c) 1 d) 0.8

_____

SLR-VB – 132

Seat No.	

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRICAL MACHINES

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* ***whenever*** *necessary.*

SECTION – I

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

a) What is electrical braking of d.c. motor ? With neat diagram clarify one breaking method used for dc shunt motor.

b) Two wattmeter connected to a three phase induction motor indicate the total input power to be 12 KW the power factor is 0.6. Determine the readings of two wattmeter.

c) Derive the relation for power factor angle in terms of two wattmeter reading.

d) Describe important features of brushless dc motor.

e) A 480 (Volt) 6-pole d.c. motor has lap connected 864 conductors on its armature and its resistance is 0.2 Ω. The motor takes current of 110 (Amp). Find its back emf and speed if it has a flux per pole of 0.05 (mwb).

3. Attempt **any two** : **(6×2=12)**

a) Which speed control method is suitable for controlling below normal value for dc series motor ? With neat diagram elaborate the same.

b) A 220 V dc shunt motor runs at 500 rpm when takes armature current of 50A. Calculate the speed if the torque is doubled. Take R_a = 0.2 Ω and assume flux remains unchanged.

c) Draw neat single line diagram and explain electrical power system.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

   a) Why rotor of three phase induction motor rotates ? Define the term slip and slip speed.

   b) Elaborate in detail advantages and disadvantages of individual drive.

   c) A three phase, 50 (Hz) transformer has delta connected primary and star connected secondary, the line voltages being 22 (KV) and 400 (V) respectively. The primary line current is 5 (Amp). Determine transformation ratio, primary and secondary phase current.

   d) Explain the concept of power factor and explain the cause of low power factor.

   e) A 6 pole, 50 (Hz) three phase squirrel cage induction motor runs on no load at a speed 970 rpm. Calculate % slip and the frequency of rotor current.

5. Attempt **any two** : **(6×2=12)**

   a) A 50 Hz 8 pole induction motor has full load slip of 4%. The rotor resistance per phase is 0.01 Ω and stand still reactance per phase of 0.1 Ω. Find the relation of maximum torque to full load torque and the speed at which becomes torque maximum.

   b) Compare three phase transformer connection star-star with delta-delta connection.

   c) Why starter is necessary for starting of three phase induction motor ? With neat diagram explain star-delta starter.

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SLR-VB – 132

Seat No.	

Set **R**

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRICAL MACHINES

Day and Date : Tuesday, 16-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

***Instructions** : 1) Figures to the **right** indicate **full** marks.*
*2) **Assume** suitable data **whenever** 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) _____ is the starter used for dc shunt motor.
a) 3-point starter b) DOL starter
c) 5-point starter d) none of the above

2) In T-T connection teaser transformer is having _____ % tapping on both primary and secondary winding.
a) 86.6 b) 50 c) 100 d) 76.8

3) If W1 and W2 readings are positive and equal in magnitude then power factor is
a) 0.95 b) 0.6 c) 1 d) 0.8

4) The rotor slots in three phase squirrel cage I.M. are kept _____
a) skewed b) parallel
c) twisted d) none of the above

5) The current drawn by a 120 V d.c. motor of armature resistance 1 ohm and back emf 110 V is
a) 20 A b) 240 A c) 110 A d) 5 A

6) In a 3 ph. I.M., Ns is speed of
a) rotor flux b) stator flux
c) motor d) none of the above

P.T.O.

7) HVDC transmission is advantageous in comparison with HVAC because
   a) dc is unidirectional
   b) dc is represented by polarities
   c) in dc magnitude is constant
   d) in dc minimum conductors are required

8) For dc shunt motor $T \alpha I_a$ because
   a) the supply voltage is constant
   b) field winding resistance is constant
   c) the speed is constant
   d) the no load current is constant

9) Brake load test is
   a) no load test
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   c) S.C. test
   d) None of the above

10) For the application traction following motor is suitable
   a) dc series motor
   b) synchronous motor
   c) squirrel cage 3 phase induction motor
   d) None of the above

11) In universal motor is designed to run on _____ supply.
   a) dc
   b) ac
   c) both dc and ac
   d) all answers are correct

12) The lagging power factor is due to reactive power drawn by _____ the load.
   a) capacitive
   b) inductive
   c) both type
   d) none of the above

13) The synchronous speed of 10 pole, 100 Hz frequency I.M. is _____ rpm.
   a) 1000 b) 1300 c) 1200 d) 1500

14) According to the principle of operation of a three phase induction motor the air gap flux is
   a) Φ_M b) $1.5\Phi_M$ c) $1.55\Phi_M$ d) $0.5\Phi_M$

_____

SLR-VB – 132

Seat No.	

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRICAL MACHINES

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* ***whenever*** *necessary.*

SECTION – I

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

a) What is electrical braking of d.c. motor ? With neat diagram clarify one breaking method used for dc shunt motor.

b) Two wattmeter connected to a three phase induction motor indicate the total input power to be 12 KW the power factor is 0.6. Determine the readings of two wattmeter.

c) Derive the relation for power factor angle in terms of two wattmeter reading.

d) Describe important features of brushless dc motor.

e) A 480 (Volt) 6-pole d.c. motor has lap connected 864 conductors on its armature and its resistance is 0.2 Ω. The motor takes current of 110 (Amp). Find its back emf and speed if it has a flux per pole of 0.05 (mwb).

3. Attempt **any two** : **(6×2=12)**

a) Which speed control method is suitable for controlling below normal value for dc series motor ? With neat diagram elaborate the same.

b) A 220 V dc shunt motor runs at 500 rpm when takes armature current of 50A. Calculate the speed if the torque is doubled. Take R_a = 0.2 Ω and assume flux remains unchanged.

c) Draw neat single line diagram and explain electrical power system.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

   a) Why rotor of three phase induction motor rotates ? Define the term slip and slip speed.

   b) Elaborate in detail advantages and disadvantages of individual drive.

   c) A three phase, 50 (Hz) transformer has delta connected primary and star connected secondary, the line voltages being 22 (KV) and 400 (V) respectively. The primary line current is 5 (Amp). Determine transformation ratio, primary and secondary phase current.

   d) Explain the concept of power factor and explain the cause of low power factor.

   e) A 6 pole, 50 (Hz) three phase squirrel cage induction motor runs on no load at a speed 970 rpm. Calculate % slip and the frequency of rotor current.

5. Attempt **any two** : **(6×2=12)**

   a) A 50 Hz 8 pole induction motor has full load slip of 4%. The rotor resistance per phase is 0.01 Ω and stand still reactance per phase of 0.1 Ω. Find the relation of maximum torque to full load torque and the speed at which becomes torque maximum.

   b) Compare three phase transformer connection star-star with delta-delta connection.

   c) Why starter is necessary for starting of three phase induction motor ? With neat diagram explain star-delta starter.

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SLR-VB – 132

Seat No.	

Set **S**

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRICAL MACHINES

Day and Date : Tuesday, 16-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) ***Assume*** *suitable data* ***whenever*** *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) In a 3 ph. I.M., Ns is speed of
   a) rotor flux b) stator flux
   c) motor d) none of the above

2) HVDC transmission is advantageous in comparison with HVAC because
   a) dc is unidirectional
   b) dc is represented by polarities
   c) in dc magnitude is constant
   d) in dc minimum conductors are required

3) For dc shunt motor $T \alpha I_a$ because
   a) the supply voltage is constant b) field winding resistance is constant
   c) the speed is constant d) the no load current is constant

4) Brake load test is
   a) no load test b) O.C. test
   c) S.C. test d) None of the above

5) For the application traction following motor is suitable
   a) dc series motor
   b) synchronous motor
   c) squirrel cage 3 phase induction motor
   d) None of the above

P.T.O.

6) In universal motor is designed to run on _____ supply.
   a) dc b) ac
   c) both dc and ac d) all answers are correct

7) The lagging power factor is due to reactive power drawn by _____ the load.
   a) capacitive b) inductive
   c) both type d) none of the above

8) The synchronous speed of 10 pole, 100 Hz frequency I.M. is _____ rpm.
   a) 1000 b) 1300 c) 1200 d) 1500

9) According to the principle of operation of a three phase induction motor the air gap flux is
   a) Φ_M b) $1.5\Phi_M$ c) $1.55\Phi_M$ d) $0.5\Phi_M$

10) _____ is the starter used for dc shunt motor.
   a) 3-point starter b) DOL starter
   c) 5-point starter d) none of the above

11) In T-T connection teaser transformer is having _____ % tapping on both primary and secondary winding.
   a) 86.6 b) 50 c) 100 d) 76.8

12) If W1 and W2 readings are positive and equal in magnitude then power factor is
   a) 0.95 b) 0.6 c) 1 d) 0.8

13) The rotor slots in three phase squirrel cage I.M. are kept _____
   a) skewed b) parallel
   c) twisted d) none of the above

14) The current drawn by a 120 V d.c. motor of armature resistance 1 ohm and back emf 110 V is
   a) 20 A b) 240 A c) 110 A d) 5 A

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SLR-VB – 132

Seat No.	

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRICAL MACHINES

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* ***whenever*** *necessary.*

SECTION – I

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

a) What is electrical braking of d.c. motor ? With neat diagram clarify one breaking method used for dc shunt motor.

b) Two wattmeter connected to a three phase induction motor indicate the total input power to be 12 KW the power factor is 0.6. Determine the readings of two wattmeter.

c) Derive the relation for power factor angle in terms of two wattmeter reading.

d) Describe important features of brushless dc motor.

e) A 480 (Volt) 6-pole d.c. motor has lap connected 864 conductors on its armature and its resistance is 0.2 Ω. The motor takes current of 110 (Amp). Find its back emf and speed if it has a flux per pole of 0.05 (mwb).

3. Attempt **any two** : **(6×2=12)**

a) Which speed control method is suitable for controlling below normal value for dc series motor ? With neat diagram elaborate the same.

b) A 220 V dc shunt motor runs at 500 rpm when takes armature current of 50A. Calculate the speed if the torque is doubled. Take R_a = 0.2 Ω and assume flux remains unchanged.

c) Draw neat single line diagram and explain electrical power system.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

   a) Why rotor of three phase induction motor rotates ? Define the term slip and slip speed.

   b) Elaborate in detail advantages and disadvantages of individual drive.

   c) A three phase, 50 (Hz) transformer has delta connected primary and star connected secondary, the line voltages being 22 (KV) and 400 (V) respectively. The primary line current is 5 (Amp). Determine transformation ratio, primary and secondary phase current.

   d) Explain the concept of power factor and explain the cause of low power factor.

   e) A 6 pole, 50 (Hz) three phase squirrel cage induction motor runs on no load at a speed 970 rpm. Calculate % slip and the frequency of rotor current.

5. Attempt **any two** : **(6×2=12)**

   a) A 50 Hz 8 pole induction motor has full load slip of 4%. The rotor resistance per phase is 0.01 Ω and stand still reactance per phase of 0.1 Ω. Find the relation of maximum torque to full load torque and the speed at which becomes torque maximum.

   b) Compare three phase transformer connection star-star with delta-delta connection.

   c) Why starter is necessary for starting of three phase induction motor ? With neat diagram explain star-delta starter.

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SLR-VB – 133

Seat No.	

Set **P**

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II

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) In CLASS AB Power amplifier collector current in the output circuit flows for
   a) 180°
   b) 360°
   c) Less than 180°
   d) Greater than 180° and Less than 360°

2) The efficiency of CLASS C power amplifier is
   a) 100% b) 78.5% c) 50% to 78.5% d) 78.5 %

3) A multistage amplifier employs four stages each of which has voltage gain of 60, then overall gain of amplifier is
   a) 142.25B b) 12960000 c) Both a) and b) d) 71.12 dB

4) The lower 3 dB frequency for n identical stages is given by
   a) $f_{L(n)} = f_L \sqrt{2^{\frac{1}{n}} + 1}$ b) $F_{L(n)} = f_L \sqrt{2^{\frac{1}{n}} - 1}$
   c) $F_{L(n)} = f_L \sqrt{1 - 2^{\frac{1}{n}}}$ d) $F_{L(n)} = \frac{f_L}{\sqrt{2^{\frac{1}{n}} - 1}}$

5) If D = 0.2, Av = 50, k = 0.01. Distortion factor with feedback is
   a) 133.3% b) 1.33% c) 13.33% d) 40.00%

P.T.O.

6) Voltage series feedback is called as
   a) Voltage amplifier
   b) Voltage controlled voltage source
   c) Transconductance amplifier
   d) Both a) and b)

7) When current series feedback is applied to an amplifier, its output resistance is
   a) is decreased
   b) is increased
   c) remains constant
   d) none of the above

8) The output voltage of LM-337 as adjustable regulator is
   a) Vo = Vref(1 + R2/R1) + IadjR1
   b) Vo = Vref(1+R1/R2) + IadjR1
   c) Vo = Vref(R2+R1)+ IadjR2
   d) None

9) Power dissipation of controlling transistor and error amplifier in a regulator circuit is _____and _____respectively.
   a) High, Low
   b) High, High
   c) Low, High
   d) Low, Low

10) The condition for sustained oscillation in Hartly oscillator is
   a) $hfe > \frac{L1 - M}{L2 - M}$
   b) $hfe \leq \frac{L1 + M}{L2 + M}$
   c) $hfe \geq \frac{L1 + M}{L2 + M}$
   d) $hfe \leq \frac{L1 - M}{L2 - M}$

11) Schmitt trigger acts as a _____ multivibrator.
   a) Astable
   b) Monostable
   c) Bistable
   d) None

12) Missing pulse detector can be designed by
   a) Astable multivibrator
   b) Monostable multivibrator
   c) Schmitt trigger
   d) Bistable multivibrator

13) The Pin No. 1,2,3 for LM-337 are _____ respectively.
   a) Vin, Vout, Iadj
   b) Iadj, Vin, Vout
   c) Iadj, Vout, Vin
   d) Vin, Iadj, Vout

14) In Wein Bridge oscillator positive feedback circuit is _____ and negative feedback circuit is
   a) Resistive, lag lead circuit
   b) Lag lead circuit, resistive circuit
   c) Resistive circuit, RC circuit
   d) LC circuit, RC circuit

_____

SLR-VB – 133

Seat No.	

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II

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

Instructions *: 1) Figures to the* ***right*** *indicates maximum marks.*
2) ***Use*** *of electronic component data sheet is* ***allowed****.*
3) ***Assume*** *suitable data if necessary.*

SECTION – I

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

1) Prove that negative feedback amplifier stabilize the gain of amplifier.

2) Show that cascaded n stages CE amplifier operating at low frequency

$$F_{L(n)} = \frac{f_L}{\sqrt{2^{\frac{1}{n}} - 1}}.$$

3) Explain with block diagram a – ve feedback amplifier and obtain expression for its closed loop gain.

4) Show that maximum efficiency of class B power amplifier will not be exceeded 78.5%.

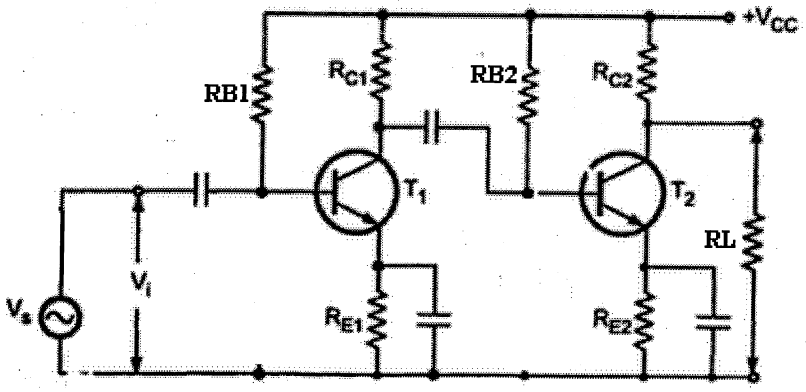
5) Compare various coupling schemes used in multistage amplifier.

3. Solve **any two** questions : **(6×2=12)**

1) Explain working of class A transformer coupled power amplifier. Derive an expression for its maximum efficiency and power dissipation.

2) Design a single stage current series feedback amplifier using 2N3904, V_{cc} = 24 V, R(load) = 100 kΩ , f_L = 50 Hz, hfe = 120, hie = 1 k, A_{VF} = 1000 Rs = 300 Ω .

3) Explain importance of cascaded connection. For given two stage RC coupled amplifier If $R_{B1} = R_{B2} = 1M\Omega$, $R_{C1} = R_{C2} = 5K\Omega$, $R_{E1} = R_{E2} = 1K\Omega$, $V_{CC} = 10V$, $\beta_1 = \beta_2 = 100$, $RL = 10K\Omega$. Calculate :
   1) Voltage gain of each stage 2) Overall voltage gain in dB



SECTION – II

4. Answer **any four** : **(4×4=16)**
   1) Why do we use crystal in oscillator circuit ? Explain working of oscillator with operating in series resonance.
   2) Design Astable Multivibrator for the maximum output frequency of 8 KHz with duty cycle <=25%.
   3) List various features of variable IC regulator.
   4) Derive expression for frequency of oscillation for monostable multivibrator using IC-555.
   5) Explain working of transistorized series voltage regulator with pre-regulator.

5. Answer **any two** : **(2×6=12)**
   1) Design a dual tracking regulator using three terminal adjustable IC voltage regulators for following specification :
      i) $V_O = \pm 8V$ to $\pm 28V$ ii) $I_O = 1.5$ A
      iii) $V_{in} = 43$ V, (use $R_1 = 240\Omega$, $I_{adj} = 150\mu$ A)
   2) Design a timer circuit that operates on 5V volt supply and turns on solid state relay for 100 m sec when triggered. The minimum voltage required to turn on the relay is 3v and the control current range of the relay is from 5 to 13 mA. The coil resistance is 400Ω.
   3) Explain working of Wien bridge oscillator. Derive an expression for frequency and minimum gain for sustained oscillations in case of Wien bridge oscillator.

Set P

SLR-VB – 133

Seat No.	

Set **Q**

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II

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 output voltage of LM-337 as adjustable regulator is
   a) Vo = Vref(1 + R2/R1) + IadjR1 b) Vo = Vref(1+R1/R2) + IadjR1
   c) Vo = Vref(R2+R1)+ IadjR2 d) None

2) Power dissipation of controlling transistor and error amplifier in a regulator circuit is _____and _____respectively.
   a) High, Low b) High, High c) Low, High d) Low, Low

3) The condition for sustained oscillation in Hartly oscillator is
   a) $hfe > \frac{L1 - M}{L2 - M}$ b) $hfe \leq \frac{L1 + M}{L2 + M}$ c) $hfe \geq \frac{L1 + M}{L2 + M}$ d) $hfe \leq \frac{L1 - M}{L2 - M}$

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

5) Missing pulse detector can be designed by
   a) Astable multivibrator b) Monostable multivibrator
   c) Schmitt trigger d) Bistable multivibrator

6) The Pin No. 1,2,3 for LM-337 are _____ respectively.
   a) Vin, Vout, Iadj b) Iadj, Vin, Vout
   c) Iadj, Vout, Vin d) Vin, Iadj, Vout

P.T.O.

7) In Wein Bridge oscillator positive feedback circuit is _____ and negative feedback circuit is
   a) Resistive, lag lead circuit
   b) Lag lead circuit, resistive circuit
   c) Resistive circuit, RC circuit
   d) LC circuit, RC circuit

8) In CLASS AB Power amplifier collector current in the output circuit flows for
   a) 180°
   b) 360°
   c) Less than 180°
   d) Greater than 180° and Less than 360°

9) The efficiency of CLASS C power amplifier is
   a) 100% b) 78.5% c) 50% to 78.5% d) 78.5 %

10) A multistage amplifier employs four stages each of which has voltage gain of 60, then overall gain of amplifier is
   a) 142.25B b) 12960000 c) Both a) and b) d) 71.12 dB

11) The lower 3 dB frequency for n identical stages is given by
   a) $f_{L(n)} = f_L \sqrt{2^{\frac{1}{n}} + 1}$
   b) $F_{L(n)} = f_L \sqrt{2^{\frac{1}{n}} - 1}$
   c) $F_{L(n)} = f_L \sqrt{1 - 2^{\frac{1}{n}}}$
   d) $F_{L(n)} = \frac{f_L}{\sqrt{2^{\frac{1}{n}} - 1}}$

12) If D = 0.2, Av = 50, k = 0.01. Distortion factor with feedback is
   a) 133.3% b) 1.33% c) 13.33% d) 40.00%

13) Voltage series feedback is called as
   a) Voltage amplifier
   b) Voltage controlled voltage source
   c) Transconductance amplifier
   d) Both a) and b)

14) When current series feedback is applied to an amplifier, its output resistance is
   a) is decreased
   b) is increased
   c) remains constant
   d) none of the above

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SLR-VB – 133

Seat No.	

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II

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

Instructions *: 1) Figures to the* ***right*** *indicates maximum marks.*
2) ***Use*** *of electronic component data sheet is* ***allowed****.*
3) ***Assume*** *suitable data if necessary.*

SECTION – I

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

1) Prove that negative feedback amplifier stabilize the gain of amplifier.

2) Show that cascaded n stages CE amplifier operating at low frequency

$$F_{L(n)} = \frac{f_L}{\sqrt{2^{\frac{1}{n}} - 1}}.$$

3) Explain with block diagram a – ve feedback amplifier and obtain expression for its closed loop gain.

4) Show that maximum efficiency of class B power amplifier will not be exceeded 78.5%.

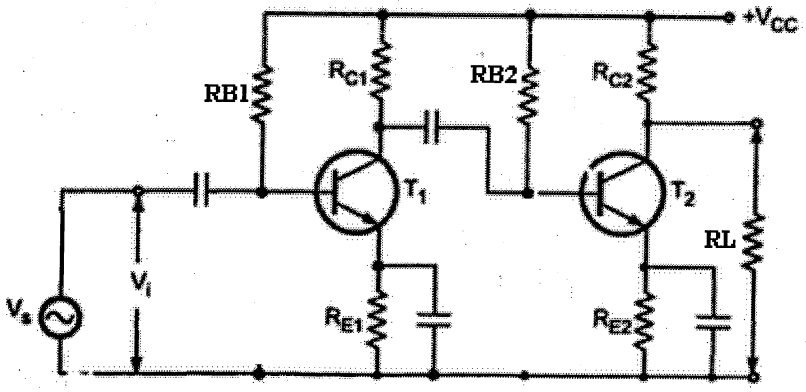
5) Compare various coupling schemes used in multistage amplifier.

3. Solve **any two** questions : **(6×2=12)**

1) Explain working of class A transformer coupled power amplifier. Derive an expression for its maximum efficiency and power dissipation.

2) Design a single stage current series feedback amplifier using 2N3904, V_{cc} = 24 V, R(load) = 100 kΩ , f_L = 50 Hz, hfe = 120, hie = 1 k, A_{VF} = 1000 Rs = 300 Ω .

3) Explain importance of cascaded connection. For given two stage RC coupled amplifier If $R_{B1} = R_{B2} = 1M\Omega$, $R_{C1} = R_{C2} = 5K\Omega$, $R_{E1} = R_{E2} = 1K\Omega$, $V_{CC} = 10V$, $\beta_1 = \beta_2 = 100$, $RL = 10K\Omega$. Calculate :
   1) Voltage gain of each stage 2) Overall voltage gain in dB



SECTION – II

4. Answer **any four** : **(4×4=16)**
   1) Why do we use crystal in oscillator circuit ? Explain working of oscillator with operating in series resonance.
   2) Design Astable Multivibrator for the maximum output frequency of 8 KHz with duty cycle <=25%.
   3) List various features of variable IC regulator.
   4) Derive expression for frequency of oscillation for monostable multivibrator using IC-555.
   5) Explain working of transistorized series voltage regulator with pre-regulator.

5. Answer **any two** : **(2×6=12)**
   1) Design a dual tracking regulator using three terminal adjustable IC voltage regulators for following specification :
      i) $V_O = \pm 8V$ to $\pm 28V$ ii) $I_O = 1.5$ A
      iii) $V_{in} = 43$ V, (use $R_1 = 240\Omega$, $I_{adj} = 150\mu$ A)
   2) Design a timer circuit that operates on 5V volt supply and turns on solid state relay for 100 m sec when triggered. The minimum voltage required to turn on the relay is 3v and the control current range of the relay is from 5 to 13 mA. The coil resistance is 400Ω.
   3) Explain working of Wien bridge oscillator. Derive an expression for frequency and minimum gain for sustained oscillations in case of Wien bridge oscillator.

Set Q

SLR-VB – 133

Seat No.	

Set R

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II

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) If D = 0.2, Av = 50, k = 0.01. Distortion factor with feedback is
   a) 133.3% b) 1.33% c) 13.33% d) 40.00%

2) Voltage series feedback is called as
   a) Voltage amplifier b) Voltage controlled voltage source
   c) Transconductance amplifier d) Both a) and b)

3) When current series feedback is applied to an amplifier, its output resistance is
   a) is decreased b) is increased
   c) remains constant d) none of the above

4) The output voltage of LM-337 as adjustable regulator is
   a) Vo = Vref(1 + R2/R1) + IadjR1 b) Vo = Vref(1+R1/R2) + IadjR1
   c) Vo = Vref(R2+R1)+ IadjR2 d) None

5) Power dissipation of controlling transistor and error amplifier in a regulator circuit is _____and _____respectively.
   a) High, Low b) High, High c) Low, High d) Low, Low

6) The condition for sustained oscillation in Hartly oscillator is
   a) $hfe > \frac{L1 - M}{L2 - M}$ b) $hfe \leq \frac{L1 + M}{L2 + M}$ c) $hfe \geq \frac{L1 + M}{L2 + M}$ d) $hfe \leq \frac{L1 - M}{L2 - M}$

P.T.O.

7) Schmitt trigger acts as a _____ multivibrator.
   a) Astable b) Monostable c) Bistable d) None

8) Missing pulse detector can be designed by
   a) Astable multivibrator b) Monostable multivibrator
   c) Schmitt trigger d) Bistable multivibrator

9) The Pin No. 1,2,3 for LM-337 are _____ respectively.
   a) Vin, Vout, Iadj b) Iadj, Vin, Vout
   c) Iadj, Vout, Vin d) Vin, Iadj, Vout

10) In Wein Bridge oscillator positive feedback circuit is _____ and negative feedback circuit is
   a) Resistive, lag lead circuit b) Lag lead circuit, resistive circuit
   c) Resistive circuit, RC circuit d) LC circuit, RC circuit

11) In CLASS AB Power amplifier collector current in the output circuit flows for
   a) 180°
   b) 360°
   c) Less than 180°
   d) Greater than 180° and Less than 360°

12) The efficiency of CLASS C power amplifier is
   a) 100% b) 78.5% c) 50% to 78.5% d) 78.5 %

13) A multistage amplifier employs four stages each of which has voltage gain of 60, then overall gain of amplifier is
   a) 142.25B b) 12960000 c) Both a) and b) d) 71.12 dB

14) The lower 3 dB frequency for n identical stages is given by
   a) $f_{L(n)} = f_L \sqrt{2^{\frac{1}{n}} + 1}$ b) $F_{L(n)} = f_L \sqrt{2^{\frac{1}{n}} - 1}$
   c) $F_{L(n)} = f_L \sqrt{1 - 2^{\frac{1}{n}}}$ d) $F_{L(n)} = \frac{f_L}{\sqrt{2^{\frac{1}{n}} - 1}}$

_____

SLR-VB – 133

Seat No.	

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II

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

Instructions *: 1) Figures to the* ***right*** *indicates maximum marks.*
2) ***Use*** *of electronic component data sheet is* ***allowed****.*
3) ***Assume*** *suitable data if necessary.*

SECTION – I

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

1) Prove that negative feedback amplifier stabilize the gain of amplifier.

2) Show that cascaded n stages CE amplifier operating at low frequency

$$F_{L(n)} = \frac{f_L}{\sqrt{2^{\frac{1}{n}} - 1}}.$$

3) Explain with block diagram a – ve feedback amplifier and obtain expression for its closed loop gain.

4) Show that maximum efficiency of class B power amplifier will not be exceeded 78.5%.

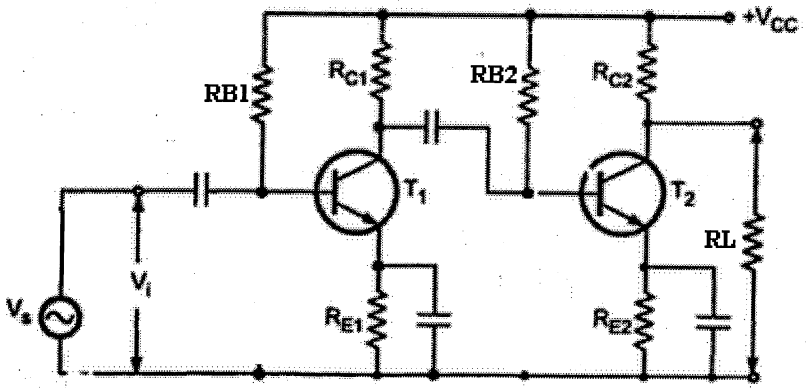
5) Compare various coupling schemes used in multistage amplifier.

3. Solve **any two** questions : **(6×2=12)**

1) Explain working of class A transformer coupled power amplifier. Derive an expression for its maximum efficiency and power dissipation.

2) Design a single stage current series feedback amplifier using 2N3904, V_{cc} = 24 V, R(load) = 100 kΩ , f_L = 50 Hz, hfe = 120, hie = 1 k, A_{VF} = 1000 Rs = 300 Ω .

3) Explain importance of cascaded connection. For given two stage RC coupled amplifier If $R_{B1} = R_{B2} = 1M\Omega$, $R_{C1} = R_{C2} = 5K\Omega$, $R_{E1} = R_{E2} = 1K\Omega$, $V_{CC} = 10V$, $\beta_1 = \beta_2 = 100$, $RL = 10K\Omega$. Calculate :
   1) Voltage gain of each stage 2) Overall voltage gain in dB



SECTION – II

4. Answer **any four** : **(4×4=16)**
   1) Why do we use crystal in oscillator circuit ? Explain working of oscillator with operating in series resonance.
   2) Design Astable Multivibrator for the maximum output frequency of 8 KHz with duty cycle <=25%.
   3) List various features of variable IC regulator.
   4) Derive expression for frequency of oscillation for monostable multivibrator using IC-555.
   5) Explain working of transistorized series voltage regulator with pre-regulator.

5. Answer **any two** : **(2×6=12)**
   1) Design a dual tracking regulator using three terminal adjustable IC voltage regulators for following specification :
      i) $V_O = \pm 8V$ to $\pm 28V$ ii) $I_O = 1.5$ A
      iii) $V_{in} = 43$ V, (use $R_1 = 240\Omega$, $I_{adj} = 150\mu$ A)
   2) Design a timer circuit that operates on 5V volt supply and turns on solid state relay for 100 m sec when triggered. The minimum voltage required to turn on the relay is 3v and the control current range of the relay is from 5 to 13 mA. The coil resistance is 400Ω.
   3) Explain working of Wien bridge oscillator. Derive an expression for frequency and minimum gain for sustained oscillations in case of Wien bridge oscillator.

Set R

SLR-VB – 133

Seat No.	

Set **S**

S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II

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 condition for sustained oscillation in Hartly oscillator is

a) $hfe > \frac{L1 - M}{L2 - M}$ b) $hfe \leq \frac{L1 + M}{L2 + M}$

c) $hfe \geq \frac{L1 + M}{L2 + M}$ d) $hfe \leq \frac{L1 - M}{L2 - M}$

2) Schmitt trigger acts as a _____ multivibrator.
a) Astable b) Monostable c) Bistable d) None

3) Missing pulse detector can be designed by
a) Astable multivibrator b) Monostable multivibrator
c) Schmitt trigger d) Bistable multivibrator

4) The Pin No. 1,2,3 for LM-337 are _____ respectively.
a) Vin, Vout, Iadj b) Iadj, Vin, Vout
c) Iadj, Vout, Vin d) Vin, Iadj, Vout

5) In Wein Bridge oscillator positive feedback circuit is _____ and negative feedback circuit is
a) Resistive, lag lead circuit b) Lag lead circuit, resistive circuit
c) Resistive circuit, RC circuit d) LC circuit, RC circuit

P.T.O.

6) In CLASS AB Power amplifier collector current in the output circuit flows for
   a) 180°
   b) 360°
   c) Less than 180°
   d) Greater than 180° and Less than 360°

7) The efficiency of CLASS C power amplifier is
   a) 100% b) 78.5% c) 50% to 78.5% d) 78.5 %

8) A multistage amplifier employs four stages each of which has voltage gain of 60, then overall gain of amplifier is
   a) 142.25B b) 12960000 c) Both a) and b) d) 71.12 dB

9) The lower 3 dB frequency for n identical stages is given by
   a) $f_{L(n)} = f_L \sqrt{2^{\frac{1}{n}} + 1}$
   b) $F_{L(n)} = f_L \sqrt{2^{\frac{1}{n}} - 1}$
   c) $F_{L(n)} = f_L \sqrt{1 - 2^{\frac{1}{n}}}$
   d) $F_{L(n)} = \frac{f_L}{\sqrt{2^{\frac{1}{n}} - 1}}$

10) If D = 0.2, Av = 50, k = 0.01. Distortion factor with feedback is
   a) 133.3% b) 1.33% c) 13.33% d) 40.00%

11) Voltage series feedback is called as
   a) Voltage amplifier b) Voltage controlled voltage source
   c) Transconductance amplifier d) Both a) and b)

12) When current series feedback is applied to an amplifier, its output resistance is
   a) is decreased b) is increased
   c) remains constant d) none of the above

13) The output voltage of LM-337 as adjustable regulator is
   a) Vo = Vref(1 + R2/R1) + IadjR1 b) Vo = Vref(1+R1/R2) + IadjR1
   c) Vo = Vref(R2+R1)+ IadjR2 d) None

14) Power dissipation of controlling transistor and error amplifier in a regulator circuit is _____and _____respectively.
   a) High, Low b) High, High c) Low, High d) Low, Low

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S.E. (Electronics) (Part – II) (CGPA) Examination, 2017
ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II

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

Instructions *: 1) Figures to the* ***right*** *indicates maximum marks.*
2) ***Use*** *of electronic component data sheet is* ***allowed****.*
3) ***Assume*** *suitable data if necessary.*

SECTION – I

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

1) Prove that negative feedback amplifier stabilize the gain of amplifier.

2) Show that cascaded n stages CE amplifier operating at low frequency

$$F_{L(n)} = \frac{f_L}{\sqrt{2^{\frac{1}{n}} - 1}}.$$

3) Explain with block diagram a – ve feedback amplifier and obtain expression for its closed loop gain.

4) Show that maximum efficiency of class B power amplifier will not be exceeded 78.5%.

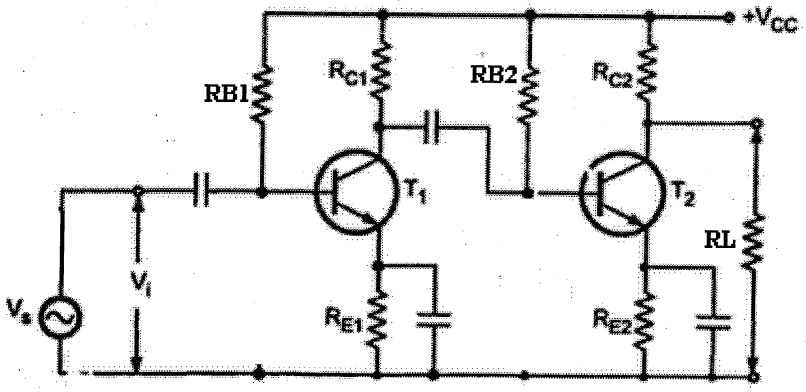
5) Compare various coupling schemes used in multistage amplifier.

3. Solve **any two** questions : **(6×2=12)**

1) Explain working of class A transformer coupled power amplifier. Derive an expression for its maximum efficiency and power dissipation.

2) Design a single stage current series feedback amplifier using 2N3904, V_{cc} = 24 V, R(load) = 100 kΩ , f_L = 50 Hz, hfe = 120, hie = 1 k, A_{VF} = 1000 Rs = 300 Ω .

3) Explain importance of cascaded connection. For given two stage RC coupled amplifier If $R_{B1} = R_{B2} = 1M\Omega$, $R_{C1} = R_{C2} = 5K\Omega$, $R_{E1} = R_{E2} = 1K\Omega$, $V_{CC} = 10V$, $\beta_1 = \beta_2 = 100$, $RL = 10K\Omega$. Calculate :
   1) Voltage gain of each stage 2) Overall voltage gain in dB



SECTION – II

4. Answer **any four** : **(4×4=16)**
   1) Why do we use crystal in oscillator circuit ? Explain working of oscillator with operating in series resonance.
   2) Design Astable Multivibrator for the maximum output frequency of 8 KHz with duty cycle <=25%.
   3) List various features of variable IC regulator.
   4) Derive expression for frequency of oscillation for monostable multivibrator using IC-555.
   5) Explain working of transistorized series voltage regulator with pre-regulator.

5. Answer **any two** : **(2×6=12)**
   1) Design a dual tracking regulator using three terminal adjustable IC voltage regulators for following specification :
      i) $V_O = \pm 8V$ to $\pm 28V$ ii) $I_O = 1.5$ A
      iii) $V_{in} = 43$ V, (use $R_1 = 240\Omega$, $I_{adj} = 150\mu$ A)
   2) Design a timer circuit that operates on 5V volt supply and turns on solid state relay for 100 m sec when triggered. The minimum voltage required to turn on the relay is 3v and the control current range of the relay is from 5 to 13 mA. The coil resistance is 400Ω.
   3) Explain working of Wien bridge oscillator. Derive an expression for frequency and minimum gain for sustained oscillations in case of Wien bridge oscillator.

Set S

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Set **P**

S.E. (Electronics Engineering) Part – II (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Saturday, 20-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicates **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. Select suitable option : **14**

1) For an AM signal, the bandwidth is 10 kHz and highest frequency component present is 705 kHz. What is the carrier frequency used for this AM signal ?
   a) 695 kHz b) 700 kHz c) 705 kHz d) 710 kHz

2) Indicate the false statement regarding the advantages of SSB over double sideband, full carrier AM signal
   a) More channel space is available
   b) Transmitter circuits must be more stable, giving better reception
   c) The signal is more noise resistance
   d) Much less power is required for the same signal length

3) _____ is the minimum AM signal needed to transmit information.
   a) Carrier plus sidebands b) Carrier only
   c) One sideband d) Both sidebands

4) An AM signal has a carrier power of 5W. The percentage modulation is 80 percent. The total sideband power is
   a) 4.0 W b) 1.6 W c) 2.5 W d) 0.8 W

5) The process of translating a signal, with or without modulation, to a higher or lower frequency for processing is called
   a) Frequency division b) Frequency shift
   c) Frequency conversion d) Frequency multiplication

P.T.O.

6) The main advantage of SSB over DSBFC is
   a) Simpler equipment is used b) Less spectrum space is used
   c) Less power is consumed d) A higher modulation percentage

7) In a FM system, if modulation index is doubled by having the modulating frequency, what will be the effect on the maximum deviation ?
   a) No effect b) Maximum deviation doubles
   c) Decreases by 0.5 d) Increases by 0.25

8) A popular half wavelength antenna is
   a) Ground plane b) Dipole c) Co-linear d) Wire end

9) Mixer is also known as a
   a) Modulator b) Suppressor c) Converter d) Beater

10) In FM receiver, signal
   a) Varies in amplitude with modulation
   b) Varies in frequency with modulation
   c) Varies in frequency and amplitude with wideband modulation
   d) Is not immune to noise

11) _____ is an electronic instrument used to show both the carrier and the sidebands of a modulated signal in the frequency domain.
   a) Spectrum analyzer b) Oscilloscope
   c) Digital counter d) Frequency counters

12) The highest electron density is found in
   a) D-layer b) E-layer c) F1-layer d) F2-layer

13) Telephone companies normally provide a voltage of _____ to power telephones.
   a) +24 volts DC b) – 24 volts DC c) + 48 volts DC d) – 48 volts DC

14) The number of point to point links required in a fully connected network for 50 entities is
   a) 1250 b) 1225 c) 2500 d) 50

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S.E. (Electronics Engineering) Part – II (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Saturday, 20-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

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

1) Give various classifications of communication system.

2) Sketch and explain AM wave for m = 1, m < 1 and m > 1. Which is a better case and why ? What are problems with m > 1 ?

3) An antenna transmits an AM signal having a total power content of 15 kW. Determine the power being transmitted at the carrier frequency and at each of the sidebands when the percent modulation is 85%. Determine transmission efficiency of the system.

4) List advantages and disadvantages of tuned radio frequency receiver.

3. Attempt **any two** : **(2×8=16)**

1) With suitable block diagram explain superheterodyne communication receiver.

2) Illustrate working principle of third method for SSB generation and prove it is better than other techniques.

3) State the relation between antenna current and modulation index. The antenna current of an AM transmitter is 8 A if only the carrier is sent, but it increases to 8.93 A if the carrier is modulated by a single sinusoidal wave. Determine the percentage modulation. Also find the antenna current if the percent of modulation changes to 0.8.

SECTION – II

4. Attempt **any three** : **(3×4=12)**
   1) State and explain modulation index, deviation ratio and percentage of modulation for FM.
   2) With suitable circuit schematic, explain working of varactor modulator for FM generation.
   3) Classify noise and give examples of each type.
   4) Explain the concept of radiation and basic antenna system.

5. Attempt **any two** : **(2×8=16)**
   1) Explain working of ratio detector with suitable diagram.
   2) What are the three basic paths that a radio signal can take through space ? Explain each one in detail.
   3) Classify telephone switching systems and explain strowger system in detail.

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Set **Q**

S.E. (Electronics Engineering) Part – II (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Saturday, 20-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
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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. Select suitable option : **14**

1) A popular half wavelength antenna is
a) Ground plane b) Dipole c) Co-linear d) Wire end

2) Mixer is also known as a
a) Modulator b) Suppressor c) Converter d) Beater

3) In FM receiver, signal
a) Varies in amplitude with modulation
b) Varies in frequency with modulation
c) Varies in frequency and amplitude with wideband modulation
d) Is not immune to noise

4) _____ is an electronic instrument used to show both the carrier and the sidebands of a modulated signal in the frequency domain.
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5) The highest electron density is found in
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6) Telephone companies normally provide a voltage of _____ to power telephones.
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7) The number of point to point links required in a fully connected network for 50 entities is
   a) 1250 b) 1225 c) 2500 d) 50

8) For an AM signal, the bandwidth is 10 kHz and highest frequency component present is 705 kHz. What is the carrier frequency used for this AM signal ?
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   a) More channel space is available
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   c) The signal is more noise resistance
   d) Much less power is required for the same signal length

10) _____ is the minimum AM signal needed to transmit information.
   a) Carrier plus sidebands b) Carrier only
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11) An AM signal has a carrier power of 5W. The percentage modulation is 80 percent. The total sideband power is
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12) The process of translating a signal, with or without modulation, to a higher or lower frequency for processing is called
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13) The main advantage of SSB over DSBFC is
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S.E. (Electronics Engineering) Part – II (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Saturday, 20-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

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

1) Give various classifications of communication system.

2) Sketch and explain AM wave for m = 1, m < 1 and m > 1. Which is a better case and why ? What are problems with m > 1 ?

3) An antenna transmits an AM signal having a total power content of 15 kW. Determine the power being transmitted at the carrier frequency and at each of the sidebands when the percent modulation is 85%. Determine transmission efficiency of the system.

4) List advantages and disadvantages of tuned radio frequency receiver.

3. Attempt **any two** : **(2×8=16)**

1) With suitable block diagram explain superheterodyne communication receiver.

2) Illustrate working principle of third method for SSB generation and prove it is better than other techniques.

3) State the relation between antenna current and modulation index. The antenna current of an AM transmitter is 8 A if only the carrier is sent, but it increases to 8.93 A if the carrier is modulated by a single sinusoidal wave. Determine the percentage modulation. Also find the antenna current if the percent of modulation changes to 0.8.

SECTION – II

4. Attempt **any three** : **(3×4=12)**
   1) State and explain modulation index, deviation ratio and percentage of modulation for FM.
   2) With suitable circuit schematic, explain working of varactor modulator for FM generation.
   3) Classify noise and give examples of each type.
   4) Explain the concept of radiation and basic antenna system.

5. Attempt **any two** : **(2×8=16)**
   1) Explain working of ratio detector with suitable diagram.
   2) What are the three basic paths that a radio signal can take through space ? Explain each one in detail.
   3) Classify telephone switching systems and explain strowger system in detail.

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Set **R**

S.E. (Electronics Engineering) Part – II (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Saturday, 20-5-2017 Max. Marks : 70
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Select suitable option : **14**

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3) In a FM system, if modulation index is doubled by having the modulating frequency, what will be the effect on the maximum deviation ?
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4) A popular half wavelength antenna is
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P.T.O.

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9) Telephone companies normally provide a voltage of _____ to power telephones.
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10) The number of point to point links required in a fully connected network for 50 entities is
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Seat No.	

S.E. (Electronics Engineering) Part – II (CGPA) Examination, 2017
ANALOG COMMUNICATION

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SECTION – I

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1) With suitable block diagram explain superheterodyne communication receiver.

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SECTION – II

4. Attempt **any three** : **(3×4=12)**
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   1) Explain working of ratio detector with suitable diagram.
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Seat No.	

Set **S**

S.E. (Electronics Engineering) Part – II (CGPA) Examination, 2017
ANALOG COMMUNICATION

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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_____

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Seat No.	

S.E. (Electronics Engineering) Part – II (CGPA) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Saturday, 20-5-2017 Marks : 56
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SECTION – I

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

1) Give various classifications of communication system.

2) Sketch and explain AM wave for m = 1, m < 1 and m > 1. Which is a better case and why ? What are problems with m > 1 ?

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4) List advantages and disadvantages of tuned radio frequency receiver.

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1) With suitable block diagram explain superheterodyne communication receiver.

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SECTION – II

4. Attempt **any three** : **(3×4=12)**
   1) State and explain modulation index, deviation ratio and percentage of modulation for FM.
   2) With suitable circuit schematic, explain working of varactor modulator for FM generation.
   3) Classify noise and give examples of each type.
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5. Attempt **any two** : **(2×8=16)**
   1) Explain working of ratio detector with suitable diagram.
   2) What are the three basic paths that a radio signal can take through space ? Explain each one in detail.
   3) Classify telephone switching systems and explain strowger system in detail.

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SLR-VB – 135

Seat No.	

Set **P**

S.E. (Electronics 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) Figures to the **right** indicates **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 : **(1×14=14)**

1) Which of below application can be realized in open loop configuration of op amp ?
   a) Schmitt trigger b) Peak detector
   c) Zero crossing detector d) Voltage follower

2) For a first order low pass filter if f_H is 1 KHz, passband gain is 2 and C = 0.01 μF , value of R is _____ Ω .
   a) 1.59 K b) 1 K c) 11.9 K d) None of these

3) A comparator followed by an integrator is a
   a) Schmitt trigger b) Log amplifier
   c) Triangular wave generator d) Square wave generator

4) Op Amp is a _____ coupled _____ amplifier.
   a) capacitor, high gain b) directly, class AB
   c) directly, high gain d) capacitor, non linear

P.T.O.

5) For 741C maximum input bias current is
   a) 500 nA b) 50 nA c) 5 nA d) 50 μA

6) Frequency of VCO NS/SE 566 is given by $f_o = \frac{2(+X - V_C)}{R_1 C_1 (+X)}$. In this X is
   a) supply voltage b) reverence voltage
   c) modulating voltage d) none of these

7) As ideal op amp has infinite input resistance
   a) op amp draws no current at both of its terminals
   b) no current enters into op amp
   c) any signal source can drive op amp and no loading on previous driving stage
   d) all of above

8) Make odd man out : slew rate, voltage swing Vs frequency, voltage follower large signal pulse response, phase response Vs frequency
   a) slew rate
   b) voltage swing Vs frequency
   c) voltage follower large signal pulse response
   d) phase response Vs frequency

9) The gain bandwidth producer of 741 is
   a) 1 MHz b) 5 Hz c) 4 MHz d) None of these

10) Which of below is called multiple feedback filter ?
   a) narrow band pass b) wide band pass
   c) narrow band stop d) wide band stop

11) A wide band reject filter may consists of
   a) high pass filter b) low pass filter
   c) adder d) all of these

12) Higher the value of _____ in dB, the lower is the change in input offset voltage due to change in supply voltage.
   a) CMRR b) CVRR c) Voltage drift d) Thermal drift

13) Phase lag and phase lead are the most commonly used
   a) Phase correctors b) OP Amp responses
   c) Compensating networks d) None of these

14) A current series negative feedback amplifier is
   a) I to V converter b) V to I converter
   c) Inverting voltage follower d) No such circuit exists

SLR-VB – 135

Seat No.	

S.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

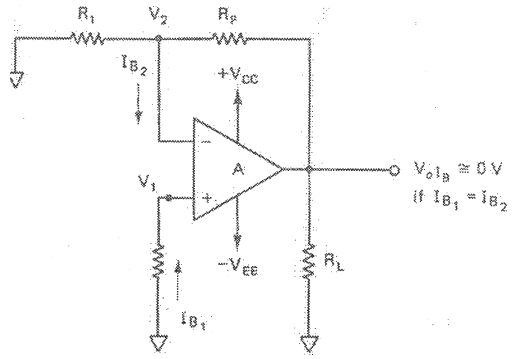
Day and Date : Tuesday, 23-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

2. Solve **any two** : **(6×2=12)**

a) For the circuit shown below what is a purpose of resistor connected to non inverting terminal of op amp to ground. Derive expression for it.



b) Design a input offset voltage compensating network for op LM 307 having supply voltage of ± 10 V and input offset voltage of 10 mV.

c) What is slew rate ? How it is specified ? What is its significance ? Show with an example how it limits close loop applications of op amp.

3. Solve **any four** : **(4×4=16)**

a) Explain voltage to current converter using Op Amps-with grounded load.

b) Why input bias current compensating network is not required for a differential amplifier ?

c) Draw and discuss non inverting amplifier with complete compensating network.

d) What are various thermal drifts ? What are the various ways to specify them ?

e) Show how op amp can be used as an analog adder.

SECTION – II

4. Solve **any two** : **(6×2=12)**

   a) With suitable diagram explain working of dual slope ADC. Discuss its advantages.

   b) Design a triangular wave generator for 2 KHz and peak to peak voltage of 7V. Use suitable op amp.

   c) Show how PLL can be used as a frequency multiplier.

5. Solve **any four** : **(4×4=16)**

   a) What are significant DAC specifications ?

   b) Analyze a positive peak detector using op amp.

   c) Justify – a rectifier designed using op amp is called precision rectifier.

   d) Compare any two types of DAC techniques.

   e) Sketch and discuss first order low pass active filter.

SLR-VB – 135

Seat No.	

Set **Q**

S.E. (Electronics 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) Figures to the **right** indicates **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 : **(1×14=14)**

1) Make odd man out : slew rate, voltage swing Vs frequency, voltage follower large signal pulse response, phase response Vs frequency
   a) slew rate
   b) voltage swing Vs frequency
   c) voltage follower large signal pulse response
   d) phase response Vs frequency

2) The gain bandwidth producer of 741 is
   a) 1 MHz b) 5 Hz c) 4 MHz d) None of these

3) Which of below is called multiple feedback filter ?
   a) narrow band pass b) wide band pass
   c) narrow band stop d) wide band stop

4) A wide band reject filter may consists of
   a) high pass filter b) low pass filter
   c) adder d) all of these

5) Higher the value of _____ in dB, the lower is the change in input offset voltage due to change in supply voltage.
   a) CMRR b) CVRR c) Voltage drift d) Thermal drift

6) Phase lag and phase lead are the most commonly used
   a) Phase correctors b) OP Amp responses
   c) Compensating networks d) None of these

7) A current series negative feedback amplifier is
   a) I to V converter b) V to I converter
   c) Inverting voltage follower d) No such circuit exists

8) Which of below application can be realized in open loop configuration of op amp ?
   a) Schmitt trigger b) Peak detector
   c) Zero crossing detector d) Voltage follower

9) For a first order low pass filter if f_H is 1 KHz, passband gain is 2 and C = 0.01 μF , value of R is _____ Ω.
   a) 1.59 K b) 1 K c) 11.9 K d) None of these

10) A comparator followed by an integrator is a
   a) Schmitt trigger b) Log amplifier
   c) Triangular wave generator d) Square wave generator

11) Op Amp is a _____ coupled _____ amplifier.
   a) capacitor, high gain b) directly, class AB
   c) directly, high gain d) capacitor, non linear

12) For 741C maximum input bias current is
   a) 500 nA b) 50 nA c) 5 nA d) 50 μA

13) Frequency of VCO NS/SE 566 is given by $f_o = \frac{2(+X - V_C)}{R_1 C_1 (+X)}$. In this X is
   a) supply voltage b) reverence voltage
   c) modulating voltage d) none of these

14) As ideal op amp has infinite input resistance
   a) op amp draws no current at both of its terminals
   b) no current enters into op amp
   c) any signal source can drive op amp and no loading on previous driving stage
   d) all of above

_____

SLR-VB – 135

Seat No.	

S.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

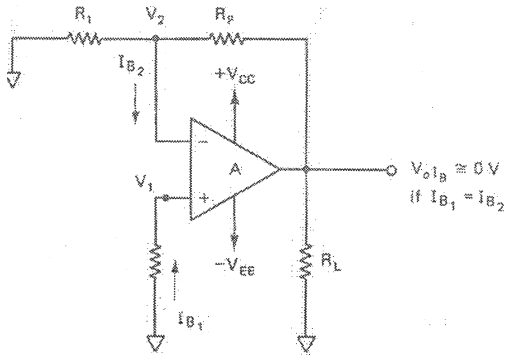
Day and Date : Tuesday, 23-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

2. Solve **any two** : **(6×2=12)**

a) For the circuit shown below what is a purpose of resistor connected to non inverting terminal of op amp to ground. Derive expression for it.



b) Design a input offset voltage compensating network for op LM 307 having supply voltage of ± 10 V and input offset voltage of 10 mV.

c) What is slew rate ? How it is specified ? What is its significance ? Show with an example how it limits close loop applications of op amp.

3. Solve **any four** : **(4×4=16)**

a) Explain voltage to current converter using Op Amps-with grounded load.

b) Why input bias current compensating network is not required for a differential amplifier ?

c) Draw and discuss non inverting amplifier with complete compensating network.

d) What are various thermal drifts ? What are the various ways to specify them ?

e) Show how op amp can be used as an analog adder.

SECTION – II

4. Solve **any two** : **(6×2=12)**

   a) With suitable diagram explain working of dual slope ADC. Discuss its advantages.

   b) Design a triangular wave generator for 2 KHz and peak to peak voltage of 7V. Use suitable op amp.

   c) Show how PLL can be used as a frequency multiplier.

5. Solve **any four** : **(4×4=16)**

   a) What are significant DAC specifications ?

   b) Analyze a positive peak detector using op amp.

   c) Justify – a rectifier designed using op amp is called precision rectifier.

   d) Compare any two types of DAC techniques.

   e) Sketch and discuss first order low pass active filter.

SLR-VB – 135

Seat No.	

Set **R**

S.E. (Electronics 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) Figures to the **right** indicates **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 : **(1×14=14)**

1) For 741C maximum input bias current is
   a) 500 nA b) 50 nA c) 5 nA d) 50 μA

2) Frequency of VCO NS/SE 566 is given by $f_o = \frac{2(+X - V_C)}{R_1 C_1 (+X)}$. In this X is
   a) supply voltage b) reverence voltage
   c) modulating voltage d) none of these

3) As ideal op amp has infinite input resistance
   a) op amp draws no current at both of its terminals
   b) no current enters into op amp
   c) any signal source can drive op amp and no loading on previous driving stage
   d) all of above

4) Make odd man out : slew rate, voltage swing Vs frequency, voltage follower large signal pulse response, phase response Vs frequency
   a) slew rate
   b) voltage swing Vs frequency
   c) voltage follower large signal pulse response
   d) phase response Vs frequency

5) The gain bandwidth producer of 741 is
   a) 1 MHz b) 5 Hz c) 4 MHz d) None of these
6) Which of below is called multiple feedback filter ?
   a) narrow band pass b) wide band pass
   c) narrow band stop d) wide band stop
7) A wide band reject filter may consists of
   a) high pass filter b) low pass filter
   c) adder d) all of these
8) Higher the value of _____ in dB, the lower is the change in input offset voltage due to change in supply voltage.
   a) CMRR b) CVRR c) Voltage drift d) Thermal drift
9) Phase lag and phase lead are the most commonly used
   a) Phase correctors b) OP Amp responses
   c) Compensating networks d) None of these
10) A current series negative feedback amplifier is
   a) I to V converter b) V to I converter
   c) Inverting voltage follower d) No such circuit exists
11) Which of below application can be realized in open loop configuration of op amp ?
   a) Schmitt trigger b) Peak detector
   c) Zero crossing detector d) Voltage follower
12) For a first order low pass filter if f_H is 1 KHz, passband gain is 2 and C = 0.01 μF , value of R is _____ Ω.
   a) 1.59 K b) 1 K c) 11.9 K d) None of these
13) A comparator followed by an integrator is a
   a) Schmitt trigger b) Log amplifier
   c) Triangular wave generator d) Square wave generator
14) Op Amp is a _____ coupled _____ amplifier.
   a) capacitor, high gain b) directly, class AB
   c) directly, high gain d) capacitor, non linear

_____

SLR-VB – 135

Seat No.	

S.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

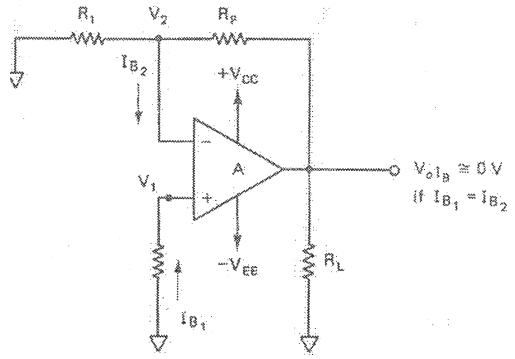
Day and Date : Tuesday, 23-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

2. Solve **any two** : **(6×2=12)**

a) For the circuit shown below what is a purpose of resistor connected to non inverting terminal of op amp to ground. Derive expression for it.



b) Design a input offset voltage compensating network for op LM 307 having supply voltage of ± 10 V and input offset voltage of 10 mV.

c) What is slew rate ? How it is specified ? What is its significance ? Show with an example how it limits close loop applications of op amp.

3. Solve **any four** : **(4×4=16)**

a) Explain voltage to current converter using Op Amps-with grounded load.

b) Why input bias current compensating network is not required for a differential amplifier ?

c) Draw and discuss non inverting amplifier with complete compensating network.

d) What are various thermal drifts ? What are the various ways to specify them ?

e) Show how op amp can be used as an analog adder.

Set R

SECTION – II

4. Solve **any two** : **(6×2=12)**

   a) With suitable diagram explain working of dual slope ADC. Discuss its advantages.

   b) Design a triangular wave generator for 2 KHz and peak to peak voltage of 7V. Use suitable op amp.

   c) Show how PLL can be used as a frequency multiplier.

5. Solve **any four** : **(4×4=16)**

   a) What are significant DAC specifications ?

   b) Analyze a positive peak detector using op amp.

   c) Justify – a rectifier designed using op amp is called precision rectifier.

   d) Compare any two types of DAC techniques.

   e) Sketch and discuss first order low pass active filter.

SLR-VB – 135

Seat No.	

Set **S**

S.E. (Electronics 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) Figures to the **right** indicates **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 : **(1×14=14)**

1) Which of below is called multiple feedback filter ?
   a) narrow band pass b) wide band pass
   c) narrow band stop d) wide band stop

2) A wide band reject filter may consists of
   a) high pass filter b) low pass filter
   c) adder d) all of these

3) Higher the value of _____ in dB, the lower is the change in input offset voltage due to change in supply voltage.
   a) CMRR b) CVRR c) Voltage drift d) Thermal drift

4) Phase lag and phase lead are the most commonly used
   a) Phase correctors b) OP Amp responses
   c) Compensating networks d) None of these

5) A current series negative feedback amplifier is
   a) I to V converter b) V to I converter
   c) Inverting voltage follower d) No such circuit exists

P.T.O.

6) Which of below application can be realized in open loop configuration of op amp ?
   a) Schmitt trigger b) Peak detector
   c) Zero crossing detector d) Voltage follower

7) For a first order low pass filter if f_H is 1 KHz, passband gain is 2 and C = 0.01 μF , value of R is _____ Ω.
   a) 1.59 K b) 1 K c) 11.9 K d) None of these

8) A comparator followed by an integrator is a
   a) Schmitt trigger b) Log amplifier
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9) Op Amp is a _____ coupled _____ amplifier.
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   c) directly, high gain d) capacitor, non linear

10) For 741C maximum input bias current is
   a) 500 nA b) 50 nA c) 5 nA d) 50 μA

11) Frequency of VCO NS/SE 566 is given by $f_o = \frac{2(+X - V_C)}{R_1 C_1 (+X)}$. In this X is
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   c) modulating voltage d) none of these

12) As ideal op amp has infinite input resistance
   a) op amp draws no current at both of its terminals
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   c) any signal source can drive op amp and no loading on previous driving stage
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13) Make odd man out : slew rate, voltage swing Vs frequency, voltage follower large signal pulse response, phase response Vs frequency
   a) slew rate
   b) voltage swing Vs frequency
   c) voltage follower large signal pulse response
   d) phase response Vs frequency

14) The gain bandwidth producer of 741 is
   a) 1 MHz b) 5 Hz c) 4 MHz d) None of these

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SLR-VB – 135

Seat No.	

S.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

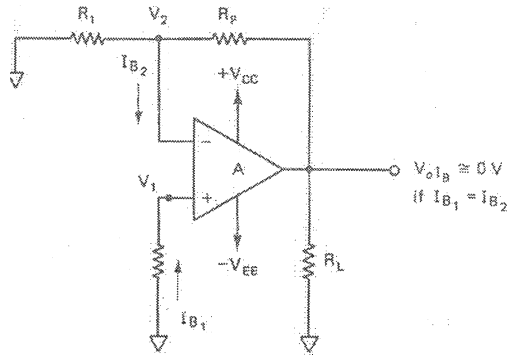
Day and Date : Tuesday, 23-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

2. Solve **any two** : **(6×2=12)**

a) For the circuit shown below what is a purpose of resistor connected to non inverting terminal of op amp to ground. Derive expression for it.



b) Design a input offset voltage compensating network for op LM 307 having supply voltage of ± 10 V and input offset voltage of 10 mV.

c) What is slew rate ? How it is specified ? What is its significance ? Show with an example how it limits close loop applications of op amp.

3. Solve **any four** : **(4×4=16)**

a) Explain voltage to current converter using Op Amps-with grounded load.

b) Why input bias current compensating network is not required for a differential amplifier ?

c) Draw and discuss non inverting amplifier with complete compensating network.

d) What are various thermal drifts ? What are the various ways to specify them ?

e) Show how op amp can be used as an analog adder.

SECTION – II

4. Solve **any two** : **(6×2=12)**

   a) With suitable diagram explain working of dual slope ADC. Discuss its advantages.

   b) Design a triangular wave generator for 2 KHz and peak to peak voltage of 7V. Use suitable op amp.

   c) Show how PLL can be used as a frequency multiplier.

5. Solve **any four** : **(4×4=16)**

   a) What are significant DAC specifications ?

   b) Analyze a positive peak detector using op amp.

   c) Justify – a rectifier designed using op amp is called precision rectifier.

   d) Compare any two types of DAC techniques.

   e) Sketch and discuss first order low pass active filter.

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SLR-VB – 136

Seat No.	

Set **P**

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

Day and Date : Thursday, 25-5-2017 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) **All** questions are **compulsory**.*
*4) Assume suitable data **if** required and state the assumptions.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) m(t) is an even function, then its Fourier representation has
a) $a_0 = 0$ b) $a_n = 0$ c) $b_n = 0$ d) $a_n = b_n$

2) For a signal periodic with $T_0 = 1$ sec, $\omega_0 =$
a) 2π b) $1/\pi$ c) $\frac{1}{2}\pi$ d) π

3) y(t) = x (t – 3) is
a) Casual b) Invertible
c) Casual and invertible d) Memory less

4) The impulse response of discrete time is $x[n] = (4)^n u[(3 - n]$, the system is
a) Casual b) Stable
c) Stable and casual d) Stable and non casual

5) Fourier transform of $\frac{dx(t)}{dt}$ is
a) $x(j\omega)$ b) $\frac{1}{j\omega}x(j\omega)$ c) $j\omega\, x(j\omega)$ d) $e^{j\omega}x(j\omega)$

6) x(t) is even symmetric signal and y(t) is odd symmetric signal then z(t) = x(t) y(t) will be
a) Even symmetric b) Odd symmetric
c) Neither even nor odd d) Zero

7) The DC coefficient a_0 for the signal x(t) = 2 cos (5t) is
a) 2 b) 5 c) 0 d) None of these

8) The mean valve of a uniformly distributed random variable between a to b is
a) (a + b)/2 b) (b – a)/2 c) (a + b) d) None of these

P.T.O.

9) The probability density function f(x) and distribution function F(x) are related by

a) F(x) = d f(x)/dx b) $F(x) = \int_0^1 f(x)\,dx$ c) $f(x) = \int_{-\infty}^{+\infty} F(x)\,dx$ d) f(x) = d F(x)/dx

10) When two honest coins are simultaneously tossed, the probability of two heads on any given trial is

a) 1 b) 3/4 c) 1/2 d) ¼

11) The analog signal $m(t) = 4\cos 50\pi t + 3\sin 300\pi t - \cos 150\pi t$. Then the value of nyquist rate Fs is _____

a) 300 Hz b) 150 Hz c) 200 Hz d) 100 Hz

12) Z transform of $\delta(n-k)$ is

a) Z^{-k} b) Z^{k} c) $Z^{1/k}$ d) 1

13) If x(t) signal is multiplied with train of impulses, the process is _____

a) Convolution b) Z transform c) Sampling d) Laplace transform

14) The PSD of white nose is _____

a) constant b) 0 c) Infinity d) None of these

_____

SLR-VB – 136

Seat No.	

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

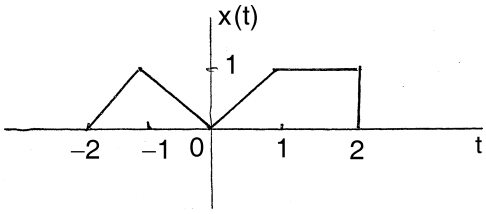
Day and Date : Thursday, 25-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

Instructions : *1) **All** questions are **compulsory**.*
2) Assume suitable data if required and state the assumptions.

SECTION – I

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

a) A continuous time signal x(t) is shown in figure. Sketch and label each of the following signals.



i) x(t – 2) ii) x(2t)
iii) x(1 – t) iv) x(t) u(t)

b) Obtain and sketch the even and odd parts of the discrete time signal x[n] shown below

$x[n] = n\{u[n + 1] – u[n – 4]\}$

c) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period

i) $3\cos(2t + \pi/4)$

ii) $x[n] = \sin(3\pi n/5 + 2)$.

d) Determine which of the properties hold and which do not for the following system

$y[n] = x[n – 1] – 2x[n – 5]$.

e) State the exponential series and derive the expression for computing the coefficients a_0 and a_k of exponential Fourier series.

f) State and prove following properties of continuous time Fourier transform

i) Time Shifting

ii) Time Scaling.

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

   a) Determine the Trigonometric Fourier series representation for the following signals x(t) periodic with period 2 and

$$x(t) = \begin{cases} 1 & -1 < t < 0 \\ -1 & 0 \le t < 1 \end{cases}$$

   b) Consider the cascade connection of two LTI systems with impulse responses h1(t) and u2(t) where h1(t) = u(t – 1) and h2(t) = e^{-t} u(t). Compute the impulse response of overall system.

   c) Determine the Fourier transform of unit impulse sequence. Making use of this and properties of transform obtain the Fourier transform of u(t).

SECTION – II

4. Solve **any four** of the following : **(4×4=16)**

   a) Explain impulse train sampling.

   b) Consider an LTI system with the system function $H(s) = \frac{s-1}{(s+1)(s-2)}$. Obtain the impulse response h(t) of the system if the system is stable, state the region of convergence of the system.

   c) Define correlation and spectral density. Explain their interrelation.

   d) Define probability density function and state its properties.

   e) Find the mean and variance of the random variable, if its PDF is as below :

$$fx(x) = x^3/12 \quad 0 < x < 1$$
$$0 \qquad \text{otherwise}$$

5. Solve **any two** of the following : **(2×6=12)**

   a) If analog signal x(t) is given as $x(t) = 2\sin(250\pi t) + 3\cos(500\pi t) + 5\sin(1000\pi t)$, calculate

      i) Nyquist sampling rate.

      ii) If the signal x(t) is sampled at the rate Fs = 3000 Hz, what is the DT signal obtained after sampling ?

      iii) What is the analog signal reconstructed from samples if deal interpolation is used ?

   b) Define the following for a random variable :

      i) Expected value

      ii) Mean square value

      iii) Variance.

      Derive the relation between these parameters.

   c) State and explain Winer Khinchin theorem of system. Also derive the relation between z transform and Laplace transform.

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SLR-VB – 136

Seat No.	

Set Q

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

Day and Date : Thursday, 25-5-2017 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) **All** questions are **compulsory**.*
*4) Assume suitable data **if** required and state the assumptions.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The mean valve of a uniformly distributed random variable between a to b is
a) (a + b)/2 b) (b – a)/2 c) (a + b) d) None of these

2) The probability density function f(x) and distribution function F(x) are related by
a) F(x) = d f(x)/dx b) $F(x) = \int_0^1 f(x)\,dx$ c) $f(x) = \int_{-\infty}^{+\infty} F(x)\,dx$ d) f(x) = d F(x)/dx

3) When two honest coins are simultaneously tossed, the probability of two heads on any given trial is
a) 1 b) 3/4 c) 1/2 d) ¼

4) The analog signal $m(t) = 4\cos 50\pi t + 3\sin 300\pi t - \cos 150\pi t$. Then the value of nyquist rate Fs is _____
a) 300 Hz b) 150 Hz c) 200 Hz d) 100 Hz

5) Z transform of $\delta(n-k)$ is
a) Z^{-k} b) Z^{k} c) $Z^{1/k}$ d) 1

6) If x(t) signal is multiplied with train of impulses, the process is _____
a) Convolution b) Z transform c) Sampling d) Laplace transform

7) The PSD of white nose is _____
a) constant b) 0 c) Infinity d) None of these

8) m(t) is an even function, then its Fourier representation has
a) $a_0 = 0$ b) $a_n = 0$ c) $b_n = 0$ d) $a_n = b_n$

P.T.O.

9) For a signal periodic with $T_0 = 1$ sec, $\omega_0 =$

a) 2π b) $1/\pi$ c) $\frac{1}{2}\pi$ d) π

10) $y(t) = x(t - 3)$ is

a) Casual b) Invertible
c) Casual and invertible d) Memory less

11) The impulse response of discrete time is $x[n] = (4)^n u[(3 - n]$, the system is

a) Casual b) Stable
c) Stable and casual d) Stable and non casual

12) Fourier transform of $\frac{dx(t)}{dt}$ is

a) $x(j\omega)$ b) $\frac{1}{j\omega} x(j\omega)$ c) $j\omega\, x(j\omega)$ d) $e^{j\omega} x(j\omega)$

13) x(t) is even symmetric signal and y(t) is odd symmetric signal then z(t) = x(t) y(t) will be

a) Even symmetric b) Odd symmetric
c) Neither even nor odd d) Zero

14) The DC coefficient a_0 for the signal $x(t) = 2 \cos(5t)$ is

a) 2 b) 5 c) 0 d) None of these

SLR-VB – 136

Seat No.	

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

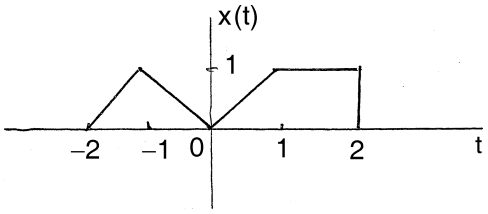
Day and Date : Thursday, 25-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

Instructions : *1) **All** questions are **compulsory**.*
2) Assume suitable data if required and state the assumptions.

SECTION – I

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

a) A continuous time signal x(t) is shown in figure. Sketch and label each of the following signals.



i) x(t – 2) ii) x(2t)
iii) x(1 – t) iv) x(t) u(t)

b) Obtain and sketch the even and odd parts of the discrete time signal x[n] shown below

$x[n] = n\{u[n + 1] – u[n – 4]\}$

c) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period

i) $3\cos(2t + \pi/4)$

ii) $x[n] = \sin(3\pi n/5 + 2)$.

d) Determine which of the properties hold and which do not for the following system

$y[n] = x[n – 1] – 2x[n – 5]$.

e) State the exponential series and derive the expression for computing the coefficients a_0 and a_k of exponential Fourier series.

f) State and prove following properties of continuous time Fourier transform

i) Time Shifting

ii) Time Scaling.

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

   a) Determine the Trigonometric Fourier series representation for the following signals x(t) periodic with period 2 and

$$x(t) = \begin{cases} 1 & -1 < t < 0 \\ -1 & 0 \le t < 1 \end{cases}$$

   b) Consider the cascade connection of two LTI systems with impulse responses h1(t) and u2(t) where h1(t) = u(t – 1) and h2(t) = e^{-t} u(t). Compute the impulse response of overall system.

   c) Determine the Fourier transform of unit impulse sequence. Making use of this and properties of transform obtain the Fourier transform of u(t).

SECTION – II

4. Solve **any four** of the following : **(4×4=16)**

   a) Explain impulse train sampling.

   b) Consider an LTI system with the system function $H(s) = \frac{s-1}{(s+1)(s-2)}$. Obtain the impulse response h(t) of the system if the system is stable, state the region of convergence of the system.

   c) Define correlation and spectral density. Explain their interrelation.

   d) Define probability density function and state its properties.

   e) Find the mean and variance of the random variable, if its PDF is as below :

$$fx(x) = x^3/12 \quad 0 < x < 1$$
$$0 \qquad \text{otherwise}$$

5. Solve **any two** of the following : **(2×6=12)**

   a) If analog signal x(t) is given as $x(t) = 2\sin(250\pi t) + 3\cos(500\pi t) + 5\sin(1000\pi t)$, calculate

      i) Nyquist sampling rate.

      ii) If the signal x(t) is sampled at the rate Fs = 3000 Hz, what is the DT signal obtained after sampling ?

      iii) What is the analog signal reconstructed from samples if deal interpolation is used ?

   b) Define the following for a random variable :

      i) Expected value

      ii) Mean square value

      iii) Variance.

      Derive the relation between these parameters.

   c) State and explain Winer Khinchin theorem of system. Also derive the relation between z transform and Laplace transform.

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Set Q

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Seat No.	

Set **R**

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

Day and Date : Thursday, 25-5-2017 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) **All** questions are **compulsory**.*
*4) Assume suitable data **if** required and state the assumptions.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Fourier transform of $\frac{d\,x(t)}{dt}$ is

a) $x(j\omega)$ b) $\frac{1}{j\omega}x(j\omega)$ c) $j\omega\, x(j\omega)$ d) $e^{j\omega}x(j\omega)$

2) x(t) is even symmetric signal and y(t) is odd symmetric signal then z(t) = x(t) y(t) will be
a) Even symmetric b) Odd symmetric
c) Neither even nor odd d) Zero

3) The DC coefficient a_0 for the signal x(t) = 2 cos (5t) is
a) 2 b) 5 c) 0 d) None of these

4) The mean valve of a uniformly distributed random variable between a to b is
a) (a + b)/2 b) (b – a)/2 c) (a + b) d) None of these

5) The probability density function f(x) and distribution function F(x) are related by
a) F(x) = d f(x)/dx b) $F(x) = \int_0^1 f(x)\,dx$ c) $f(x) = \int_{-\infty}^{+\infty} F(x)\,dx$ d) f(x) = d F(x)/dx

6) When two honest coins are simultaneously tossed, the probability of two heads on any given trial is
a) 1 b) 3/4 c) 1/2 d) ¼

7) The analog signal $m(t) = 4\cos 50\pi t + 3\sin 300\pi t - \cos 150\pi t$. Then the value of nyquist rate Fs is _____
a) 300 Hz b) 150 Hz c) 200 Hz d) 100 Hz

P.T.O.

8) Z transform of $\delta(n-k)$ is
   a) Z^{-k} b) Z^{k} c) $Z^{1/k}$ d) 1

9) If x(t) signal is multiplied with train of impulses, the process is _____
   a) Convolution b) Z transform c) Sampling d) Laplace transform

10) The PSD of white nose is _____
   a) constant b) 0 c) Infinity d) None of these

11) m(t) is an even function, then its Fourier representation has
   a) $a_0 = 0$ b) $a_n = 0$ c) $b_n = 0$ d) $a_n = b_n$

12) For a signal periodic with $T_0 = 1$ sec, ω_0 =
   a) 2π b) $1/\pi$ c) $\frac{1}{2}\pi$ d) π

13) y(t) = x (t – 3) is
   a) Casual b) Invertible
   c) Casual and invertible d) Memory less

14) The impulse response of discrete time is x[n] = $(4)^n$ u [(3 – n], the system is
   a) Casual b) Stable
   c) Stable and casual d) Stable and non casual

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SLR-VB – 136

Seat No.	

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

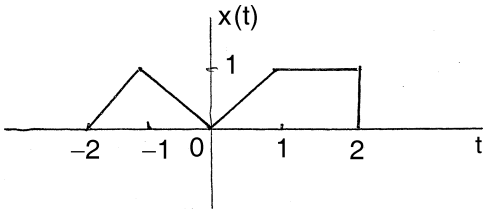
Day and Date : Thursday, 25-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

Instructions : *1) **All** questions are **compulsory**.*
2) Assume suitable data if required and state the assumptions.

SECTION – I

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

a) A continuous time signal x(t) is shown in figure. Sketch and label each of the following signals.



i) x(t – 2) ii) x(2t)
iii) x(1 – t) iv) x(t) u(t)

b) Obtain and sketch the even and odd parts of the discrete time signal x[n] shown below

x[n] = n{u[n + 1] – u[n – 4]}

c) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period

i) $3\cos(2t + \pi/4)$

ii) $x[n] = \sin(3\pi n/5 + 2)$.

d) Determine which of the properties hold and which do not for the following system

y[n] = x[n – 1] – 2x[n – 5].

e) State the exponential series and derive the expression for computing the coefficients a_0 and a_k of exponential Fourier series.

f) State and prove following properties of continuous time Fourier transform

i) Time Shifting

ii) Time Scaling.

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

   a) Determine the Trigonometric Fourier series representation for the following signals x(t) periodic with period 2 and

   $$x(t) = \begin{cases} 1 & -1 < t < 0 \\ -1 & 0 \le t < 1 \end{cases}$$

   b) Consider the cascade connection of two LTI systems with impulse responses h1(t) and u2(t) where h1(t) = u(t – 1) and h2(t) = e^{-t} u(t). Compute the impulse response of overall system.

   c) Determine the Fourier transform of unit impulse sequence. Making use of this and properties of transform obtain the Fourier transform of u(t).

SECTION – II

4. Solve **any four** of the following : **(4×4=16)**

   a) Explain impulse train sampling.

   b) Consider an LTI system with the system function $H(s) = \frac{s-1}{(s+1)(s-2)}$. Obtain the impulse response h(t) of the system if the system is stable, state the region of convergence of the system.

   c) Define correlation and spectral density. Explain their interrelation.

   d) Define probability density function and state its properties.

   e) Find the mean and variance of the random variable, if its PDF is as below :

   $$fx(x) = x^3/12 \quad 0 < x < 1$$
   $$0 \qquad \text{otherwise}$$

5. Solve **any two** of the following : **(2×6=12)**

   a) If analog signal x(t) is given as $x(t) = 2\sin(250\pi t) + 3\cos(500\pi t) + 5\sin(1000\pi t)$, calculate

      i) Nyquist sampling rate.

      ii) If the signal x(t) is sampled at the rate Fs = 3000 Hz, what is the DT signal obtained after sampling ?

      iii) What is the analog signal reconstructed from samples if deal interpolation is used ?

   b) Define the following for a random variable :

      i) Expected value

      ii) Mean square value

      iii) Variance.

      Derive the relation between these parameters.

   c) State and explain Winer Khinchin theorem of system. Also derive the relation between z transform and Laplace transform.

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SLR-VB – 136

Seat No.	

Set **S**

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

Day and Date : Thursday, 25-5-2017 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) **All** questions are **compulsory**.*
*4) Assume suitable data **if** required and state the assumptions.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) When two honest coins are simultaneously tossed, the probability of two heads on any given trial is
a) 1 b) 3/4 c) 1/2 d) ¼

2) The analog signal $m(t) = 4\cos 50\pi t + 3\sin 300\pi t - \cos 150\pi t$. Then the value of nyquist rate Fs is _____
a) 300 Hz b) 150 Hz c) 200 Hz d) 100 Hz

3) Z transform of $\delta(n-k)$ is
a) Z^{-k} b) Z^{k} c) $Z^{1/k}$ d) 1

4) If x(t) signal is multiplied with train of impulses, the process is _____
a) Convolution b) Z transform c) Sampling d) Laplace transform

5) The PSD of white nose is _____
a) constant b) 0 c) Infinity d) None of these

6) m(t) is an even function, then its Fourier representation has
a) $a_0 = 0$ b) $a_n = 0$ c) $b_n = 0$ d) $a_n = b_n$

7) For a signal periodic with $T_0 = 1$ sec, $\omega_0 =$
a) 2π b) $1/\pi$ c) $\frac{1}{2}\pi$ d) π

8) y(t) = x (t – 3) is
a) Casual b) Invertible
c) Casual and invertible d) Memory less

P.T.O.

9) The impulse response of discrete time is $x[n] = (4)^n u[(3 - n]$, the system is
   a) Casual
   b) Stable
   c) Stable and casual
   d) Stable and non casual

10) Fourier transform of $\frac{d\,x(t)}{dt}$ is

   a) $x(j\omega)$ b) $\frac{1}{j\omega}x(j\omega)$ c) $j\omega\, x(j\omega)$ d) $e^{j\omega}x(j\omega)$

11) x(t) is even symmetric signal and y(t) is odd symmetric signal then z(t) = x(t) y(t) will be
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   c) Neither even nor odd
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12) The DC coefficient a_0 for the signal x(t) = 2 cos (5t) is
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13) The mean valve of a uniformly distributed random variable between a to b is
   a) (a + b)/2 b) (b – a)/2 c) (a + b) d) None of these

14) The probability density function f(x) and distribution function F(x) are related by

   a) F(x) = d f(x)/dx b) $F(x) = \int_0^1 f(x)\,dx$ c) $f(x) = \int_{-\infty}^{+\infty} F(x)\,dx$ d) f(x) = d F(x)/dx

SLR-VB – 136

Seat No.	

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

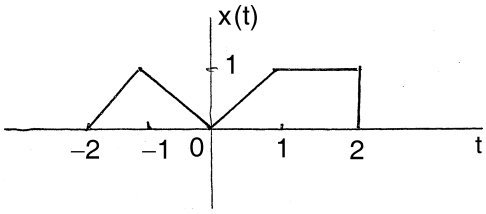
Day and Date : Thursday, 25-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

Instructions : *1) **All** questions are **compulsory**.*
2) Assume suitable data if required and state the assumptions.

SECTION – I

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

a) A continuous time signal x(t) is shown in figure. Sketch and label each of the following signals.



i) x(t – 2) ii) x(2t)
iii) x(1 – t) iv) x(t) u(t)

b) Obtain and sketch the even and odd parts of the discrete time signal x[n] shown below
x[n] = n{u[n + 1] – u[n – 4]}

c) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period
i) $3\cos(2t + \pi/4)$
ii) $x[n] = \sin(3\pi n/5 + 2)$.

d) Determine which of the properties hold and which do not for the following system
y[n] = x[n – 1] – 2x[n – 5].

e) State the exponential series and derive the expression for computing the coefficients a_0 and a_k of exponential Fourier series.

f) State and prove following properties of continuous time Fourier transform
i) Time Shifting
ii) Time Scaling.

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

   a) Determine the Trigonometric Fourier series representation for the following signals x(t) periodic with period 2 and

$$x(t) = \begin{cases} 1 & -1 < t < 0 \\ -1 & 0 \le t < 1 \end{cases}$$

   b) Consider the cascade connection of two LTI systems with impulse responses h1(t) and u2(t) where h1(t) = u(t – 1) and h2(t) = e^{-t} u(t). Compute the impulse response of overall system.

   c) Determine the Fourier transform of unit impulse sequence. Making use of this and properties of transform obtain the Fourier transform of u(t).

SECTION – II

4. Solve **any four** of the following : **(4×4=16)**

   a) Explain impulse train sampling.

   b) Consider an LTI system with the system function $H(s) = \frac{s-1}{(s+1)(s-2)}$. Obtain the impulse response h(t) of the system if the system is stable, state the region of convergence of the system.

   c) Define correlation and spectral density. Explain their interrelation.

   d) Define probability density function and state its properties.

   e) Find the mean and variance of the random variable, if its PDF is as below :

$$fx(x) = x^3/12 \quad 0 < x < 1$$
$$0 \qquad \text{otherwise}$$

5. Solve **any two** of the following : **(2×6=12)**

   a) If analog signal x(t) is given as $x(t) = 2\sin(250\pi t) + 3\cos(500\pi t) + 5\sin(1000\pi t)$, calculate

      i) Nyquist sampling rate.

      ii) If the signal x(t) is sampled at the rate Fs = 3000 Hz, what is the DT signal obtained after sampling ?

      iii) What is the analog signal reconstructed from samples if deal interpolation is used ?

   b) Define the following for a random variable :

      i) Expected value

      ii) Mean square value

      iii) Variance.

      Derive the relation between these parameters.

   c) State and explain Winer Khinchin theorem of system. Also derive the relation between z transform and Laplace transform.

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SLR-VB – 137

Seat No.	

Set **P**

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

Day and Date : Thursday, 4-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) Assume data if ***necessary****.*
3) ***All*** *questions are* ***compulsory****.*
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 (**each one** mark) :

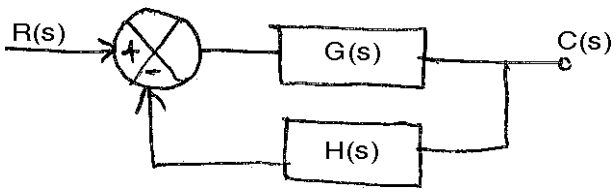
1) Peak time tp =

a) $\frac{\pi}{\omega d}$ b) $\frac{\pi}{\omega n}$ c) $\frac{\omega n}{\pi}$ d) $\frac{\omega d}{\pi}$

2) f(t) = A. δ (t) in this equation unit impulse occurs when A =
a) zero b) one c) $> \perp$ d) <1

3) In case of synchro error detection, the electrical zero position of control transformer is obtained when angular displacement between rotors is
a) 0° b) 45° c) 90° d) 180°

4) The transfer function of following block diagram is



a) $\frac{G(S)}{1+G(S).H(S)}$ b) $\frac{G(S)}{1-G(S).H(S)}$ c) $\frac{1}{1+G(S)[H(S)]}$ d) $\frac{1}{1-G(S).H(S)}$

5) Time required for the response to reach 50% of steady state value for first time is called
   a) rise time b) settling time c) peak time d) delay time

6) The equation for ramp signal is given by
   a) $f(t) = A.\delta(t)$ b) $f(t) = A.u(t)$ c) $f(t) = A.t$ d) $f(t) = A/2\ t^2$

7) Transfer function of a system in the ratio of output to the input in _____ transform.
   a) z b) laplace c) fourier d) all above

8) The Hurwitz criterion uses _____ for determining stability.
   a) array b) matrices c) determinant d) equation

9) In frequency domain analysis the system is given by $G(S)H(S) = \frac{10}{(s+3)}$ the magnitude of the system is
   a) $\sqrt{10}$ b) 10 c) $\sqrt{3}$ d) 3

10) Lead compensation is used to
   a) Improve transient response b) Improve gain margin
   c) Improve phase margin d) All of the above

11) While plotting the root locus for the following system whose transfer function is $G(S) = \frac{K}{s(s+1)(s+2)(s+3)}$ the centroid is at
   a) 1.5 b) -1.5 c) 1.0 d) -1.0

12) In root locus the order of characteristics equation gives number of
   a) root locus branches b) break away point
   c) zeros d) centroid

13) In frequency domain analysis the input is
   a) Sine wave with variable frequency b) Step signal
   c) Ramp signal d) Parabolic signal

14) According Routh-Hurwitz criterion in special case number one is
   a) All elements of any row are zero
   b) First elements of any row is zero
   c) Second elements of any row is zero
   d) None of the above

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SLR-VB – 137

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

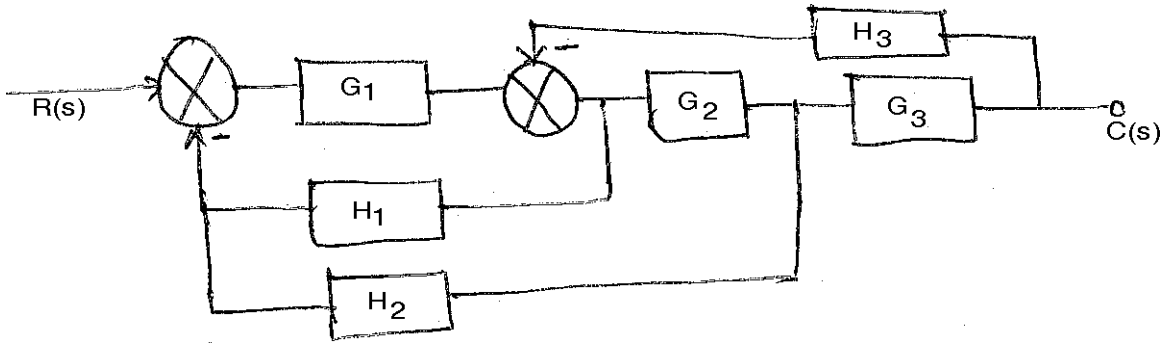
Day and Date : Thursday, 4-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

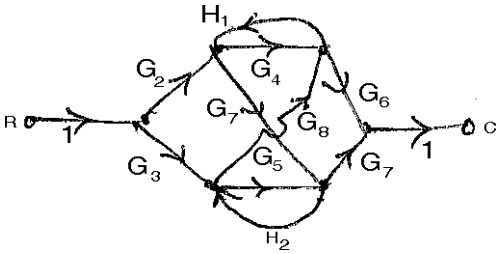
2. Solve **any four** (**each 4** marks) : **16**
   a) Explain types of control system and write short note on liquid level control system.
   b) Derive the transfer function of series RLC circuit.
   c) Determine steady state error to unit step and unit parabolic input for unity f/b system whose transfer function is $G(S) = \frac{1}{s(1+s)(1+4s)}$.
   d) Derive relation for rise time of IInd order system.
   e) Explain transfer function of field controlled D.C. motor.

3. Solve **any two** (**6** marks **each**) : **12**
   a) Reduce given block diagram and find transfer function.



b) Explain steady state error and error constants of type 0, type 1 and type 2 system. Also explain what is compensator and its types.

c) Obtain overall transfer function for following signal flow graph.



SECTION – II

4. Solve **any four** : **(4×4=16)**

a) What is polar plot ? Draw polar plot for type one system.

b) Using Routh criterion determine satiability of the following characteristic equation $F(s) = 2s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$.

c) Find the forced sinusoidal response of the following system.

$$G(s) = \frac{10}{s^2 + 3s + 10};\ r(t) = 8\ \cos\ (2t + 30).$$

d) What is compensator ? Explain lead type compensator.

e) What is Bode plot ? Explain steps for drawing Bode plot.

5. Solve **any two** : **(2×6=12)**

a) Sketch the bode plot and determine phase cross over frequency for the system $G(S) = \frac{1}{(s+3)^3}$.

b) Explain rules for drawing root locus.

c) Using Routh criterion determine range of K for satiability of system with following characteristic equation and find the frequency of sustained oscillations.

$F(s) = s^4 + 25s^3 + 15s^2 + 20s + K = 0.$

_____

SLR-VB – 137

Seat No.	

Set Q

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

Day and Date : Thursday, 4-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) Assume data if ***necessary****.*
3) ***All*** *questions are* ***compulsory****.*
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 (**each one** mark) :

1) The Hurwitz criterion uses _____ for determining stability.
a) array b) matrices c) determinant d) equation

2) In frequency domain analysis the system is given by $G(S)H(S) = \frac{10}{(s+3)}$ the magnitude of the system is
a) $\sqrt{10}$ b) 10 c) $\sqrt{3}$ d) 3

3) Lead compensation is used to
a) Improve transient response b) Improve gain margin
c) Improve phase margin d) All of the above

4) While plotting the root locus for the following system whose transfer function is $G(S) = \frac{K}{s(s+1)(s+2)(s+3)}$ the centroid is at
a) 1.5 b) – 1.5 c) 1.0 d) – 1.0

5) In root locus the order of characteristics equation gives number of
a) root locus branches b) break away point
c) zeros d) centroid

P.T.O.

6) In frequency domain analysis the input is
   a) Sine wave with variable frequency b) Step signal
   c) Ramp signal d) Parabolic signal

7) According Routh-Hurwitz criterion in special case number one is
   a) All elements of any row are zero
   b) First elements of any row is zero
   c) Second elements of any row is zero
   d) None of the above

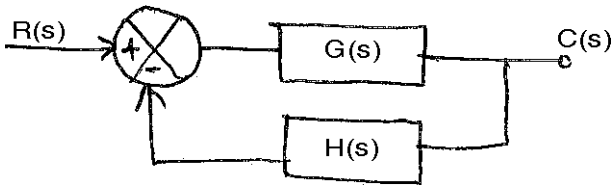
8) Peak time tp =

   a) $\frac{\pi}{\omega d}$ b) $\frac{\pi}{\omega n}$ c) $\frac{\omega n}{\pi}$ d) $\frac{\omega d}{\pi}$

9) $f(t) = A.\delta(t)$ in this equation unit impulse occurs when A =
   a) zero b) one c) $> \perp$ d) <1

10) In case of synchro error detection, the electrical zero position of control transformer is obtained when angular displacement between rotors is
   a) 0° b) 45° c) 90° d) 180°

11) The transfer function of following block diagram is



   a) $\frac{G(S)}{1+G(S).H(S)}$ b) $\frac{G(S)}{1-G(S).H(S)}$ c) $\frac{1}{1+G(S)[H(S)]}$ d) $\frac{1}{1-G(S).H(S)}$

12) Time required for the response to reach 50% of steady state value for first time is called
   a) rise time b) settling time c) peak time d) delay time

13) The equation for ramp signal is given by
   a) $f(t) = A.\delta(t)$ b) $f(t) = A.u(t)$ c) $f(t) = A.t$ d) $f(t) = A/2\ t^2$

14) Transfer function of a system in the ratio of output to the input in _____ transform.
   a) z b) laplace c) fourier d) all above

SLR-VB – 137

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

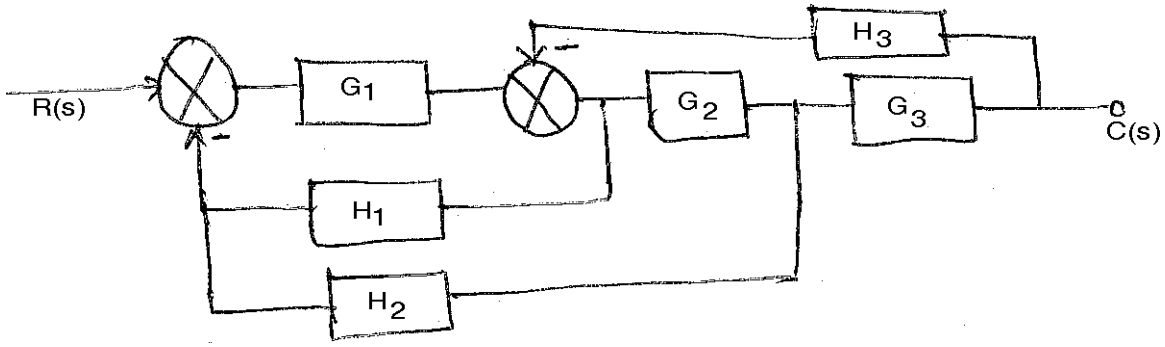
Day and Date : Thursday, 4-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

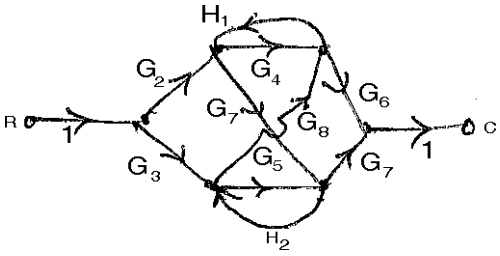
2. Solve **any four** (**each 4** marks) : **16**
   a) Explain types of control system and write short note on liquid level control system.
   b) Derive the transfer function of series RLC circuit.
   c) Determine steady state error to unit step and unit parabolic input for unity f/b system whose transfer function is $G(S) = \frac{1}{s(1+s)(1+4s)}$.
   d) Derive relation for rise time of IInd order system.
   e) Explain transfer function of field controlled D.C. motor.

3. Solve **any two** (**6** marks **each**) : **12**
   a) Reduce given block diagram and find transfer function.



b) Explain steady state error and error constants of type 0, type 1 and type 2 system. Also explain what is compensator and its types.

c) Obtain overall transfer function for following signal flow graph.



SECTION – II

4. Solve **any four** : **(4×4=16)**

a) What is polar plot ? Draw polar plot for type one system.

b) Using Routh criterion determine satiability of the following characteristic equation $F(s) = 2s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$.

c) Find the forced sinusoidal response of the following system.

$$G(s) = \frac{10}{s^2 + 3s + 10};\ r(t) = 8\ \cos\ (2t + 30).$$

d) What is compensator ? Explain lead type compensator.

e) What is Bode plot ? Explain steps for drawing Bode plot.

5. Solve **any two** : **(2×6=12)**

a) Sketch the bode plot and determine phase cross over frequency for the system $G(S) = \frac{1}{(s+3)^3}$.

b) Explain rules for drawing root locus.

c) Using Routh criterion determine range of K for satiability of system with following characteristic equation and find the frequency of sustained oscillations.

$F(s) = s^4 + 25s^3 + 15s^2 + 20s + K = 0.$

SLR-VB – 137

Seat No.	

Set **R**

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

Day and Date : Thursday, 4-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) Assume data if ***necessary****.*
3) ***All*** *questions are* ***compulsory****.*
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 (**each one** mark) :

1) Time required for the response to reach 50% of steady state value for first time is called
   a) rise time b) settling time c) peak time d) delay time

2) The equation for ramp signal is given by
   a) $f(t) = A.\delta(t)$ b) $f(t) = A.u(t)$ c) $f(t) = A.t$ d) $f(t) = A/2\ t^2$

3) Transfer function of a system in the ratio of output to the input in _____ transform.
   a) z b) laplace c) fourier d) all above

4) The Hurwitz criterion uses _____ for determining stability.
   a) array b) matrices c) determinant d) equation

5) In frequency domain analysis the system is given by $G(S)H(S) = \frac{10}{(s+3)}$ the magnitude of the system is
   a) $\sqrt{10}$ b) 10 c) $\sqrt{3}$ d) 3

6) Lead compensation is used to
   a) Improve transient response b) Improve gain margin
   c) Improve phase margin d) All of the above

P.T.O.

7) While plotting the root locus for the following system whose transfer function is $G(S) = \frac{K}{s(s+1)(s+2)(s+3)}$ the centroid is at

a) 1.5 b) – 1.5 c) 1.0 d) – 1.0

8) In root locus the order of characteristics equation gives number of
a) root locus branches b) break away point
c) zeros d) centroid

9) In frequency domain analysis the input is
a) Sine wave with variable frequency b) Step signal
c) Ramp signal d) Parabolic signal

10) According Routh-Hurwitz criterion in special case number one is
a) All elements of any row are zero
b) First elements of any row is zero
c) Second elements of any row is zero
d) None of the above

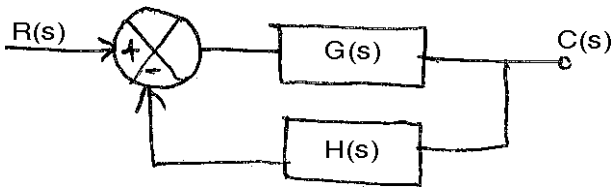
11) Peak time tp =

a) $\frac{\pi}{\omega d}$ b) $\frac{\pi}{\omega n}$ c) $\frac{\omega n}{\pi}$ d) $\frac{\omega d}{\pi}$

12) $f(t) = A.\delta(t)$ in this equation unit impulse occurs when A =
a) zero b) one c) $> \perp$ d) <1

13) In case of synchro error detection, the electrical zero position of control transformer is obtained when angular displacement between rotors is
a) 0° b) 45° c) 90° d) 180°

14) The transfer function of following block diagram is



a) $\frac{G(S)}{1+G(S).H(S)}$ b) $\frac{G(S)}{1-G(S).H(S)}$ c) $\frac{1}{1+G(S)[H(S)]}$ d) $\frac{1}{1-G(S).H(S)}$

SLR-VB – 137

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

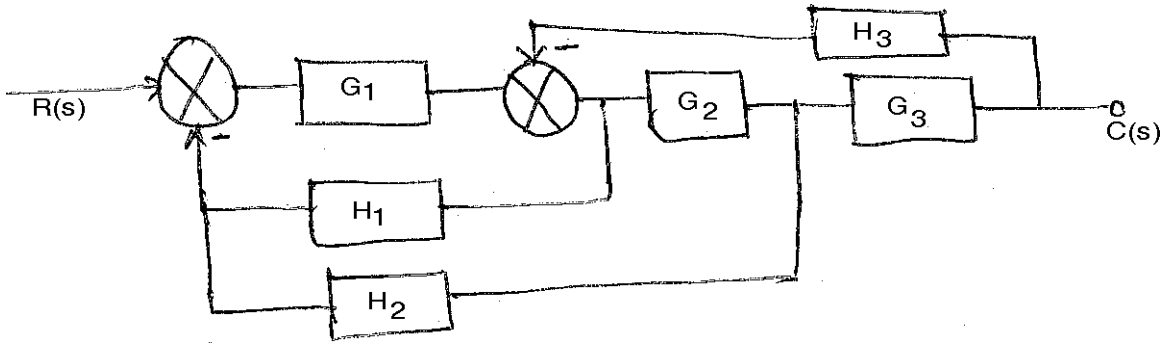
Day and Date : Thursday, 4-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

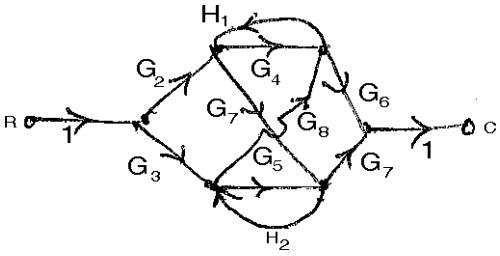
2. Solve **any four** (**each 4** marks) : **16**
   a) Explain types of control system and write short note on liquid level control system.
   b) Derive the transfer function of series RLC circuit.
   c) Determine steady state error to unit step and unit parabolic input for unity f/b system whose transfer function is $G(S) = \frac{1}{s(1+s)(1+4s)}$.
   d) Derive relation for rise time of IInd order system.
   e) Explain transfer function of field controlled D.C. motor.

3. Solve **any two** (**6** marks **each**) : **12**
   a) Reduce given block diagram and find transfer function.



b) Explain steady state error and error constants of type 0, type 1 and type 2 system. Also explain what is compensator and its types.

c) Obtain overall transfer function for following signal flow graph.



SECTION – II

4. Solve **any four** : **(4×4=16)**

a) What is polar plot ? Draw polar plot for type one system.

b) Using Routh criterion determine satiability of the following characteristic equation $F(s) = 2s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$.

c) Find the forced sinusoidal response of the following system.

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d) What is compensator ? Explain lead type compensator.

e) What is Bode plot ? Explain steps for drawing Bode plot.

5. Solve **any two** : **(2×6=12)**

a) Sketch the bode plot and determine phase cross over frequency for the system $G(S) = \frac{1}{(s+3)^3}$.

b) Explain rules for drawing root locus.

c) Using Routh criterion determine range of K for satiability of system with following characteristic equation and find the frequency of sustained oscillations.

$F(s) = s^4 + 25s^3 + 15s^2 + 20s + K = 0.$

_____

SLR-VB – 137

Seat No.	

Set **S**

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

Day and Date : Thursday, 4-5-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) Assume data if ***necessary****.*
3) ***All*** *questions are* ***compulsory****.*
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 (**each one** mark) :

1) Lead compensation is used to
   a) Improve transient response b) Improve gain margin
   c) Improve phase margin d) All of the above

2) While plotting the root locus for the following system whose transfer function is $G(S) = \frac{K}{s(s+1)(s+2)(s+3)}$ the centroid is at
   a) 1.5 b) – 1.5 c) 1.0 d) – 1.0

3) In root locus the order of characteristics equation gives number of
   a) root locus branches b) break away point
   c) zeros d) centroid

4) In frequency domain analysis the input is
   a) Sine wave with variable frequency b) Step signal
   c) Ramp signal d) Parabolic signal

5) According Routh-Hurwitz criterion in special case number one is
   a) All elements of any row are zero
   b) First elements of any row is zero
   c) Second elements of any row is zero
   d) None of the above

6) Peak time tp =

a) $\frac{\pi}{\omega d}$ b) $\frac{\pi}{\omega n}$ c) $\frac{\omega n}{\pi}$ d) $\frac{\omega d}{\pi}$

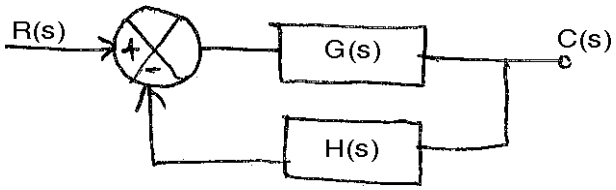
7) f(t) = A.δ (t) in this equation unit impulse occurs when A =

a) zero b) one c) $> \perp$ d) <1

8) In case of synchro error detection, the electrical zero position of control transformer is obtained when angular displacement between rotors is

a) 0° b) 45° c) 90° d) 180°

9) The transfer function of following block diagram is



a) $\frac{G(S)}{1+G(S).H(S)}$ b) $\frac{G(S)}{1-G(S).H(S)}$ c) $\frac{1}{1+G(S)[H(S)]}$ d) $\frac{1}{1-G(S).H(S)}$

10) Time required for the response to reach 50% of steady state value for first time is called

a) rise time b) settling time c) peak time d) delay time

11) The equation for ramp signal is given by

a) f(t) = A.δ(t) b) f(t) = A.u(t) c) f(t) = A.t d) f(t) = A/2 t^2

12) Transfer function of a system in the ratio of output to the input in _____ transform.

a) z b) laplace c) fourier d) all above

13) The Hurwitz criterion uses _____ for determining stability.

a) array b) matrices c) determinant d) equation

14) In frequency domain analysis the system is given by $G(S)H(S) = \frac{10}{(s+3)}$ the magnitude of the system is

a) $\sqrt{10}$ b) 10 c) $\sqrt{3}$ d) 3

_____

SLR-VB – 137

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

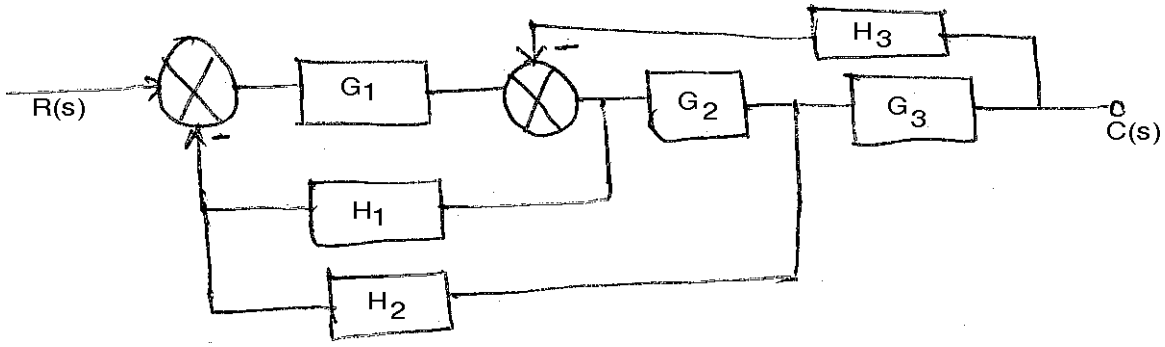
Day and Date : Thursday, 4-5-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

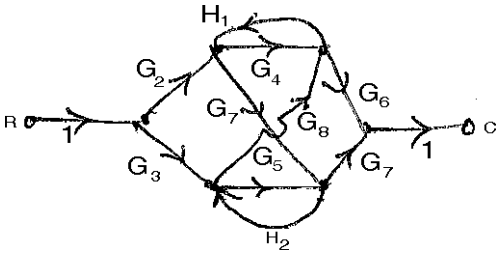
2. Solve **any four** (**each 4** marks) : **16**
   a) Explain types of control system and write short note on liquid level control system.
   b) Derive the transfer function of series RLC circuit.
   c) Determine steady state error to unit step and unit parabolic input for unity f/b system whose transfer function is $G(S) = \frac{1}{s(1+s)(1+4s)}$.
   d) Derive relation for rise time of IInd order system.
   e) Explain transfer function of field controlled D.C. motor.

3. Solve **any two** (**6** marks **each**) : **12**
   a) Reduce given block diagram and find transfer function.



b) Explain steady state error and error constants of type 0, type 1 and type 2 system. Also explain what is compensator and its types.

c) Obtain overall transfer function for following signal flow graph.



SECTION – II

4. Solve **any four** : **(4×4=16)**

a) What is polar plot ? Draw polar plot for type one system.

b) Using Routh criterion determine satiability of the following characteristic equation $F(s) = 2s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$.

c) Find the forced sinusoidal response of the following system.

$$G(s) = \frac{10}{s^2 + 3s + 10};\ r(t) = 8 \cos (2t + 30).$$

d) What is compensator ? Explain lead type compensator.

e) What is Bode plot ? Explain steps for drawing Bode plot.

5. Solve **any two** : **(2×6=12)**

a) Sketch the bode plot and determine phase cross over frequency for the system $G(S) = \frac{1}{(s+3)^3}$.

b) Explain rules for drawing root locus.

c) Using Routh criterion determine range of K for satiability of system with following characteristic equation and find the frequency of sustained oscillations.

$F(s) = s^4 + 25s^3 + 15s^2 + 20s + K = 0$.

SLR-VB – 138

Seat No.	

Set **P**

T.E. (Electronics Engg.) (Part – I) Examination, 2017
DIGITAL SIGNAL PROCESSING (CGPA)

Day and Date : Friday, 5-5-2017 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) ***All*** *questions are* ***compulsory****.*
4) Figures to ***right*** *indicate* ***full*** *marks.*
5) Assume suitable data ***if necessary****.*
6) Draw ***neat*** *diagrams* ***wherever*** *required.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose correct option : **(1×14=14)**

1) The number of multipliers required for realization of FIR system is reduced if we choose
   a) Direct form b) Cascade form
   c) Parallel form d) Linear phase realization

2) The circular convolution of x[n] = {0, 1, 2} and h[n] = {1, 1, 0} is
   a) {0, 2, 3} b) {1, 2, 3} c) {1 ,1, 1} d) {2, 1, 3}

3) Calculate DFT of x(n) = {1, 0, 1, 0}
   a) x (k) = {2, 0, 2, 0} b) x (k) = {1, 0, 1, 0}
   c) x (k) = {2, 0, 1, 0} d) none

4) DFT Samples are
   a) Samples of DTFT b) Samples of FT
   c) Samples of LT d) Samples of ZT

5) The first six points of the 8-point DFT of a real valued sequence are 5, 1 – j3, 0, 3 – 4j, and 3 + j4. The last two points of the DFT are respectively.
   a) 0, 1 – j3 b) 0, 1 + j3 c) 1 + j3, 5 d) 1 – j3

6) DFT of a impulse function is
   a) $\delta[n]$ b) 1 c) $\delta[n-1]$ d) None

7) Overlap and save algorithm uses overlap for
   a) output sequence
   b) input sequence
   c) both input and output sequence
   d) adds the overlapped output

8) When carrying out floating point additions the operands should be normalized to have the same exponent. This is achieved by which of the following unit ?
   a) Multiply and Accumulate (MAC)
   b) Arithmetic and Logic unit
   c) Shifter
   d) Guards bits

9) The addressing mode that is convenient for FFT computation is
   a) Indirect addressing
   b) Circular mode addressing
   c) Bit reversed addressing
   d) Memory mapped addressing

10) Non linearity in the relationship between Ω and ω is known as
   a) Aliasing
   b) Frequency warping
   c) Unwarping
   d) Frequency mixing

11) The frequency mapping from s domain to z domain using impulse invariant technique is
   a) Many to one
   b) Many to many
   c) One to many
   d) None of the above

12) The approximate width of the main lobe in Hanning window of length M is
   a) $8\pi/M$
   b) $4\pi/M$
   c) $12\pi/M$
   d) $16\pi/M$

13) FIR filters are
   a) All pole filters
   b) All zero filters
   c) Pole zero filters
   d) Unstable filters

14) For getting the linear phase response in DSP we use
   a) Butterworth filters
   b) IIR filters
   c) Convolution
   d) FIR filters

———————

SLR-VB – 138

Seat No.	

T.E. (Electronics Engg.) (Part – I) Examination, 2017
DIGITAL SIGNAL PROCESSING (CGPA)

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) Figures to ***right*** *indicate* ***full*** *marks.*
3) Assume suitable data ***if necessary****.*
4) Draw ***neat*** *diagrams* ***wherever*** *required.*

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   a) Explain DSP system with a neat block diagram.
   b) Find DFT of DT signal given below x[n] = {1, 0, 0, 1}. Use matrix method.
   c) Realize the system with difference equation.
   $y(n) = \frac{3}{4}\, y(n-1) - \frac{1}{8}\, y(n-2) + x(n) + \frac{1}{3} x(n-1)$ in cascade form.
   d) Compute the circular convolution of x1(n) = {1, 4, 2, 3} and x2(n) = {–2, 4, 3, 1}.
   e) Explain the properties of twiddle factor which allow the development of fast algorithm for DFT computation.

3. Attempt **any two** : **(2×6=12)**
   a) A DT LTI system is characterized by transfer function
   $H[z] = \frac{z(3z-4)}{\left(z-\frac{1}{2}\right)(z-3)}$. Specify the ROC of H [z] and determine h[n] for
      i) System is stable
      ii) The system is causal
      iii) The system is anti causal.
   b) Compute the convolution of following using overlap and add method. Use block size L = 4.
   x(n) = {1 2 3 4 4 3 2 1] and h(n) = {–1, 1, 2}
   c) What is radix of an algorithm ? Specify the steps for radix–2 DIT FFT algorithm.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

a) Convert the analog filter to digital filter whose system function is

$H(s) = \frac{s}{s^2 + 3s + 2}$. Use bilinear transformation. Assume T = 1s.

b) Describe the applications of DSP in various fields.

c) Explain in brief the special addressing modes provided in the architecture of DSP.

d) Explain the Windowing technique for FIR filter design along with different window functions.

e) Design the first order low pass filter with fc = 1.2 kHz and sampling frequency fs = 10 KHz. Use bilinear transformation method.

5. Attempt **any two** : **(2×6=12)**

a) Explain the Impulse Invariant technique in detail.

b) A low pass filter is to be designed with the desired frequency response as

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

Determine the filter coefficients hd(n). Also determine $H(e^{j\omega})$ using Rectangular window for M = 5.

c) A low pass filter is to be designed with the desired frequency response as

$$Hd(e^{j\omega}) = \begin{cases} e^{-j3\omega} & 0 \le \omega \le \pi/2 \\ 0 & \frac{\pi}{2} \le \omega \le \pi \end{cases}$$

Determine the filter coefficients h(n) for M = 7, using frequency sampling method.

SLR-VB – 138

Seat No.	

Set **Q**

T.E. (Electronics Engg.) (Part – I) Examination, 2017
DIGITAL SIGNAL PROCESSING (CGPA)

Day and Date : Friday, 5-5-2017 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) **All** questions are **compulsory**.*
*4) Figures to **right** indicate **full** marks.*
*5) Assume suitable data **if necessary**.*
*6) Draw **neat** diagrams **wherever** required.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose correct option : **(1×14=14)**

1) When carrying out floating point additions the operands should be normalized to have the same exponent. This is achieved by which of the following unit ?
   a) Multiply and Accumulate (MAC)
   b) Arithmetic and Logic unit
   c) Shifter
   d) Guards bits

2) The addressing mode that is convenient for FFT computation is
   a) Indirect addressing b) Circular mode addressing
   c) Bit reversed addressing d) Memory mapped addressing

3) Non linearity in the relationship between Ω and ω is known as
   a) Aliasing b) Frequency warping
   c) Unwarping d) Frequency mixing

4) The frequency mapping from s domain to z domain using impulse invariant technique is
   a) Many to one b) Many to many
   c) One to many d) None of the above

5) The approximate width of the main lobe in Hanning window of length M is
   a) $8\pi/M$ b) $4\pi/M$
   c) $12\pi/M$ d) $16\pi/M$

P.T.O.

6) FIR filters are
   a) All pole filters
   b) All zero filters
   c) Pole zero filters
   d) Unstable filters

7) For getting the linear phase response in DSP we use
   a) Butterworth filters
   b) IIR filters
   c) Convolution
   d) FIR filters

8) The number of multipliers required for realization of FIR system is reduced if we choose
   a) Direct form
   b) Cascade form
   c) Parallel form
   d) Linear phase realization

9) The circular convolution of x[n] = {0, 1, 2} and h[n] = {1, 1, 0} is
   a) {0, 2, 3} b) {1, 2, 3} c) {1 ,1, 1} d) {2, 1, 3}

10) Calculate DFT of x(n) = {1, 0, 1, 0}
   a) x (k) = {2, 0, 2, 0}
   b) x (k) = {1, 0, 1, 0}
   c) x (k) = {2, 0, 1, 0}
   d) none

11) DFT Samples are
   a) Samples of DTFT
   b) Samples of FT
   c) Samples of LT
   d) Samples of ZT

12) The first six points of the 8-point DFT of a real valued sequence are 5, 1 – j3, 0, 3 – 4j, and 3 + j4. The last two points of the DFT are respectively.
   a) 0, 1 – j3 b) 0, 1 + j3 c) 1 + j3, 5 d) 1 – j3

13) DFT of a impulse function is
   a) $\delta[n]$ b) 1 c) $\delta[n-1]$ d) None

14) Overlap and save algorithm uses overlap for
   a) output sequence
   b) input sequence
   c) both input and output sequence
   d) adds the overlapped output

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SLR-VB – 138

Seat No.	

T.E. (Electronics Engg.) (Part – I) Examination, 2017
DIGITAL SIGNAL PROCESSING (CGPA)

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) Figures to ***right*** *indicate* ***full*** *marks.*
3) Assume suitable data ***if necessary****.*
4) Draw ***neat*** *diagrams* ***wherever*** *required.*

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   a) Explain DSP system with a neat block diagram.
   b) Find DFT of DT signal given below x[n] = {1, 0, 0, 1}. Use matrix method.
   c) Realize the system with difference equation.
   $y(n) = \frac{3}{4}\, y(n-1) - \frac{1}{8}\, y(n-2) + x(n) + \frac{1}{3} x(n-1)$ in cascade form.
   d) Compute the circular convolution of x1(n) = {1, 4, 2, 3} and x2(n) = {–2, 4, 3, 1}.
   e) Explain the properties of twiddle factor which allow the development of fast algorithm for DFT computation.

3. Attempt **any two** : **(2×6=12)**
   a) A DT LTI system is characterized by transfer function
   $H[z] = \frac{z(3z-4)}{\left(z-\frac{1}{2}\right)(z-3)}$. Specify the ROC of H [z] and determine h[n] for
      i) System is stable
      ii) The system is causal
      iii) The system is anti causal.
   b) Compute the convolution of following using overlap and add method. Use block size L = 4.
   x(n) = {1 2 3 4 4 3 2 1] and h(n) = {–1, 1, 2}
   c) What is radix of an algorithm ? Specify the steps for radix–2 DIT FFT algorithm.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

   a) Convert the analog filter to digital filter whose system function is

   $H(s) = \frac{s}{s^2 + 3s + 2}$. Use bilinear transformation. Assume T = 1s.

   b) Describe the applications of DSP in various fields.

   c) Explain in brief the special addressing modes provided in the architecture of DSP.

   d) Explain the Windowing technique for FIR filter design along with different window functions.

   e) Design the first order low pass filter with fc = 1.2 kHz and sampling frequency fs = 10 KHz. Use bilinear transformation method.

5. Attempt **any two** : **(2×6=12)**

   a) Explain the Impulse Invariant technique in detail.

   b) A low pass filter is to be designed with the desired frequency response as

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

   Determine the filter coefficients hd(n). Also determine $H(e^{j\omega})$ using Rectangular window for M = 5.

   c) A low pass filter is to be designed with the desired frequency response as

$$Hd(e^{j\omega}) = \begin{cases} e^{-j3\omega} & 0 \le \omega \le \pi/2 \\ 0 & \frac{\pi}{2} \le \omega \le \pi \end{cases}$$

   Determine the filter coefficients h(n) for M = 7, using frequency sampling method.

SLR-VB – 138

Seat No.	

Set **R**

T.E. (Electronics Engg.) (Part – I) Examination, 2017
DIGITAL SIGNAL PROCESSING (CGPA)

Day and Date : Friday, 5-5-2017 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) **All** questions are **compulsory**.*
*4) Figures to **right** indicate **full** marks.*
*5) Assume suitable data **if necessary**.*
*6) Draw **neat** diagrams **wherever** required.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose correct option : **(1×14=14)**

1) The first six points of the 8-point DFT of a real valued sequence are 5, 1 – j3, 0, 3 – 4j, and 3 + j4. The last two points of the DFT are respectively.
a) 0, 1 – j3 b) 0, 1 + j3 c) 1 + j3, 5 d) 1 – j3

2) DFT of a impulse function is
a) $\delta[n]$ b) 1 c) $\delta[n-1]$ d) None

3) Overlap and save algorithm uses overlap for
a) output sequence
b) input sequence
c) both input and output sequence
d) adds the overlapped output

4) When carrying out floating point additions the operands should be normalized to have the same exponent. This is achieved by which of the following unit ?
a) Multiply and Accumulate (MAC)
b) Arithmetic and Logic unit
c) Shifter
d) Guards bits

5) The addressing mode that is convenient for FFT computation is
a) Indirect addressing b) Circular mode addressing
c) Bit reversed addressing d) Memory mapped addressing

P.T.O.

6) Non linearity in the relationship between Ω and ω is known as
   a) Aliasing b) Frequency warping
   c) Unwarping d) Frequency mixing

7) The frequency mapping from s domain to z domain using impulse invariant technique is
   a) Many to one b) Many to many
   c) One to many d) None of the above

8) The approximate width of the main lobe in Hanning window of length M is
   a) $8\pi/M$ b) $4\pi/M$
   c) $12\pi/M$ d) $16\pi/M$

9) FIR filters are
   a) All pole filters b) All zero filters
   c) Pole zero filters d) Unstable filters

10) For getting the linear phase response in DSP we use
   a) Butterworth filters b) IIR filters
   c) Convolution d) FIR filters

11) The number of multipliers required for realization of FIR system is reduced if we choose
   a) Direct form b) Cascade form
   c) Parallel form d) Linear phase realization

12) The circular convolution of x[n] = {0, 1, 2} and h[n] = {1, 1, 0} is
   a) {0, 2, 3} b) {1, 2, 3} c) {1 ,1, 1} d) {2, 1, 3}

13) Calculate DFT of x(n) = {1, 0, 1, 0}
   a) x (k) = {2, 0, 2, 0} b) x (k) = {1, 0, 1, 0}
   c) x (k) = {2, 0, 1, 0} d) none

14) DFT Samples are
   a) Samples of DTFT b) Samples of FT
   c) Samples of LT d) Samples of ZT

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SLR-VB – 138

Seat No.	

T.E. (Electronics Engg.) (Part – I) Examination, 2017
DIGITAL SIGNAL PROCESSING (CGPA)

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) Figures to ***right*** *indicate* ***full*** *marks.*
3) Assume suitable data ***if necessary****.*
4) Draw ***neat*** *diagrams* ***wherever*** *required.*

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   a) Explain DSP system with a neat block diagram.
   b) Find DFT of DT signal given below x[n] = {1, 0, 0, 1}. Use matrix method.
   c) Realize the system with difference equation.
   $y(n) = \frac{3}{4}\, y(n-1) - \frac{1}{8}\, y(n-2) + x(n) + \frac{1}{3} x(n-1)$ in cascade form.
   d) Compute the circular convolution of x1(n) = {1, 4, 2, 3} and x2(n) = {–2, 4, 3, 1}.
   e) Explain the properties of twiddle factor which allow the development of fast algorithm for DFT computation.

3. Attempt **any two** : **(2×6=12)**
   a) A DT LTI system is characterized by transfer function
   $H[z] = \frac{z(3z-4)}{\left(z-\frac{1}{2}\right)(z-3)}$. Specify the ROC of H [z] and determine h[n] for
      i) System is stable
      ii) The system is causal
      iii) The system is anti causal.
   b) Compute the convolution of following using overlap and add method. Use block size L = 4.
   x(n) = {1 2 3 4 4 3 2 1] and h(n) = {–1, 1, 2}
   c) What is radix of an algorithm ? Specify the steps for radix–2 DIT FFT algorithm.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

a) Convert the analog filter to digital filter whose system function is

$H(s) = \frac{s}{s^2 + 3s + 2}$. Use bilinear transformation. Assume T = 1s.

b) Describe the applications of DSP in various fields.

c) Explain in brief the special addressing modes provided in the architecture of DSP.

d) Explain the Windowing technique for FIR filter design along with different window functions.

e) Design the first order low pass filter with fc = 1.2 kHz and sampling frequency fs = 10 KHz. Use bilinear transformation method.

5. Attempt **any two** : **(2×6=12)**

a) Explain the Impulse Invariant technique in detail.

b) A low pass filter is to be designed with the desired frequency response as

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

Determine the filter coefficients hd(n). Also determine $H(e^{j\omega})$ using Rectangular window for M = 5.

c) A low pass filter is to be designed with the desired frequency response as

$$Hd(e^{j\omega}) = \begin{cases} e^{-j3\omega} & 0 \le \omega \le \pi/2 \\ 0 & \frac{\pi}{2} \le \omega \le \pi \end{cases}$$

Determine the filter coefficients h(n) for M = 7, using frequency sampling method.

SLR-VB – 138

Seat No.	

Set **S**

T.E. (Electronics Engg.) (Part – I) Examination, 2017
DIGITAL SIGNAL PROCESSING (CGPA)

Day and Date : Friday, 5-5-2017 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) **All** questions are **compulsory**.*
*4) Figures to **right** indicate **full** marks.*
*5) Assume suitable data **if necessary**.*
*6) Draw **neat** diagrams **wherever** required.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose correct option : **(1×14=14)**

1) Non linearity in the relationship between Ω and ω is known as
   a) Aliasing b) Frequency warping
   c) Unwarping d) Frequency mixing

2) The frequency mapping from s domain to z domain using impulse invariant technique is
   a) Many to one b) Many to many
   c) One to many d) None of the above

3) The approximate width of the main lobe in Hanning window of length M is
   a) $8\pi/M$ b) $4\pi/M$
   c) $12\pi/M$ d) $16\pi/M$

4) FIR filters are
   a) All pole filters b) All zero filters
   c) Pole zero filters d) Unstable filters

5) For getting the linear phase response in DSP we use
   a) Butterworth filters b) IIR filters
   c) Convolution d) FIR filters

6) The number of multipliers required for realization of FIR system is reduced if we choose
   a) Direct form
   b) Cascade form
   c) Parallel form
   d) Linear phase realization

7) The circular convolution of x[n] = {0, 1, 2} and h[n] = {1, 1, 0} is
   a) {0, 2, 3} b) {1, 2, 3} c) {1 ,1, 1} d) {2, 1, 3}

8) Calculate DFT of x(n) = {1, 0, 1, 0}
   a) x (k) = {2, 0, 2, 0}
   b) x (k) = {1, 0, 1, 0}
   c) x (k) = {2, 0, 1, 0}
   d) none

9) DFT Samples are
   a) Samples of DTFT
   b) Samples of FT
   c) Samples of LT
   d) Samples of ZT

10) The first six points of the 8-point DFT of a real valued sequence are 5, 1 – j3, 0, 3 – 4j, and 3 + j4. The last two points of the DFT are respectively.
   a) 0, 1 – j3 b) 0, 1 + j3 c) 1 + j3, 5 d) 1 – j3

11) DFT of a impulse function is
   a) $\delta[n]$ b) 1 c) $\delta[n-1]$ d) None

12) Overlap and save algorithm uses overlap for
   a) output sequence
   b) input sequence
   c) both input and output sequence
   d) adds the overlapped output

13) When carrying out floating point additions the operands should be normalized to have the same exponent. This is achieved by which of the following unit ?
   a) Multiply and Accumulate (MAC)
   b) Arithmetic and Logic unit
   c) Shifter
   d) Guards bits

14) The addressing mode that is convenient for FFT computation is
   a) Indirect addressing
   b) Circular mode addressing
   c) Bit reversed addressing
   d) Memory mapped addressing

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SLR-VB – 138

Seat No.	

T.E. (Electronics Engg.) (Part – I) Examination, 2017
DIGITAL SIGNAL PROCESSING (CGPA)

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) Figures to ***right*** *indicate* ***full*** *marks.*
3) Assume suitable data ***if necessary****.*
4) Draw ***neat*** *diagrams* ***wherever*** *required.*

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   a) Explain DSP system with a neat block diagram.
   b) Find DFT of DT signal given below x[n] = {1, 0, 0, 1}. Use matrix method.
   c) Realize the system with difference equation.
   $y(n) = \frac{3}{4}\, y(n-1) - \frac{1}{8}\, y(n-2) + x(n) + \frac{1}{3} x(n-1)$ in cascade form.
   d) Compute the circular convolution of x1(n) = {1, 4, 2, 3} and x2(n) = {–2, 4, 3, 1}.
   e) Explain the properties of twiddle factor which allow the development of fast algorithm for DFT computation.

3. Attempt **any two** : **(2×6=12)**
   a) A DT LTI system is characterized by transfer function
   $H[z] = \frac{z(3z-4)}{\left(z-\frac{1}{2}\right)(z-3)}$. Specify the ROC of H [z] and determine h[n] for
      i) System is stable
      ii) The system is causal
      iii) The system is anti causal.
   b) Compute the convolution of following using overlap and add method. Use block size L = 4.
   x(n) = {1 2 3 4 4 3 2 1] and h(n) = {–1, 1, 2}
   c) What is radix of an algorithm ? Specify the steps for radix–2 DIT FFT algorithm.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

a) Convert the analog filter to digital filter whose system function is

$H(s) = \frac{s}{s^2 + 3s + 2}$. Use bilinear transformation. Assume T = 1s.

b) Describe the applications of DSP in various fields.

c) Explain in brief the special addressing modes provided in the architecture of DSP.

d) Explain the Windowing technique for FIR filter design along with different window functions.

e) Design the first order low pass filter with fc = 1.2 kHz and sampling frequency fs = 10 KHz. Use bilinear transformation method.

5. Attempt **any two** : **(2×6=12)**

a) Explain the Impulse Invariant technique in detail.

b) A low pass filter is to be designed with the desired frequency response as

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

Determine the filter coefficients hd(n). Also determine $H(e^{j\omega})$ using Rectangular window for M = 5.

c) A low pass filter is to be designed with the desired frequency response as

$$Hd(e^{j\omega}) = \begin{cases} e^{-j3\omega} & 0 \le \omega \le \pi/2 \\ 0 & \frac{\pi}{2} \le \omega \le \pi \end{cases}$$

Determine the filter coefficients h(n) for M = 7, using frequency sampling method.

SLR-VB – 139

Seat No.	

Set P

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

Day and Date : Saturday, 6-5-2017 Total Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) ***Assume*** *suitable data* ***wherever*** *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) Single stepping is useful for
   a) I/O interfacing b) debugging
   c) wait state d) slower memory interfacing

2) Which stack is used in 8085 ?
   a) FIFO b) LIFO
   c) Random access d) None of above

3) The instruction "LXI H, 9000" requires _____ T-states.
   a) 13 b) 7 c) 10 d) 18

4) DAA stands for
   a) Decimal Adjust Accumulator b) Direct Adjust Address
   c) Decimal Adjust Address d) Direct Adjust Accumulator

5) The memory map of a 2 KB memory begins at the location 4000 H. What is the last location on the chip ?
   a) 43FFH b) 4FFFH c) 47FFH d) 7FFFH

6) Serial input data of 8085 can be loaded into bit 7 of the accumulator by
   a) executing a RIM instruction b) executing RST1
   c) using TRAP d) none of the above

P.T.O.

7) Shadow Address will exist in
   a) absolute decoding b) linear decoding
   c) partial decoding d) none of the above

8) IO mode, mode 1 uses _____ for handshaking signals.
   a) Port A b) Port B c) Port C d) Port D

9) _____ can be used as an output port.
   a) Buffer b) Latch c) Decoder d) Encoder

10) For DAC 0808, the output _____ is proportional to input digital count.
   a) Voltage b) Current c) Resistance d) Voltage and Current

11) What is RIM ?
   a) Read Interrupt Mask b) Read Interrupt Memory
   c) Read Input Memory d) None of the above

12) Control register and status register of 8251 are having the _____ address and are _____ respectively.
   a) Different, read and write b) Different, write and read
   c) Same, write and read d) Same, read and write

13) RS 232 standard is defined for
   a) Parallel communication b) Serial communication
   c) Both a) and b) d) None of the above

14) In 8251 control word register, if SC1 = 0 and SC0 = 1, then the counter selected is
   a) counter 0 b) counter 1 c) counter 2 d) none

_____

SLR-VB – 139

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

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

SECTION – I

2. Answer **any four** : **(4×4=16)**

a) Explain how information is stored and retrieved from stack using PUSH and POP and the stack pointer.

b) Write a program to find largest number from a given array of 10 elements.

c) Write a program for division of two 8-bit hex numbers.

d) Explain single cycle and single stepping.

e) Differentiate absolute and linear address decoding.

3. Answer **any two** : **(2×6=12)**

a) Design a 8085 microprocessor based system with 4 KB EPROM having a word length of 8-bits with the starting address of 0000H and two 2KB RAMs having word lengths of 8-bits each with starting address of 4000H and 8000h respectively.

b) Draw and explain interrupt structure in 8085.

c) Write a program to convert 8 bit hex number to BCD. Explain the key instructions used in the program.

SECTION – II

4. Answer **any four** : **(4×4=16)**

   a) Explain mode of operations of 8253.

   b) Interface 8255 to the 8085 in I/O mapped I/O with address 40h.

   c) Write a program to transfer a character through SOD pin of 8085.

   d) Draw and explain Flash type ADC.

   e) Draw timing diagram for the instruction : 6780 : OUT 40h.

5. Answer **any two** : **(2×6=12)**

   a) Interface stepper motor to 8085. Write a program to run stepper motor for two revolution.

   b) Explain the mode and command words of 8251.

   c) Interface two digit seven segment display to 8085 and write a program to display BCD numbers from 00 to 99.

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SLR-VB – 139

Seat No.	

Set Q

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

Day and Date : Saturday, 6-5-2017 Total Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) ***Assume*** *suitable data* ***wherever*** *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) IO mode, mode 1 uses _____ for handshaking signals.
a) Port A b) Port B c) Port C d) Port D

2) _____ can be used as an output port.
a) Buffer b) Latch c) Decoder d) Encoder

3) For DAC 0808, the output _____ is proportional to input digital count.
a) Voltage b) Current c) Resistance d) Voltage and Current

4) What is RIM ?
a) Read Interrupt Mask b) Read Interrupt Memory
c) Read Input Memory d) None of the above

5) Control register and status register of 8251 are having the _____ address and are _____ respectively.
a) Different, read and write b) Different, write and read
c) Same, write and read d) Same, read and write

6) RS 232 standard is defined for
a) Parallel communication b) Serial communication
c) Both a) and b) d) None of the above

P.T.O.

7) In 8251 control word register, if SC1 = 0 and SC0 = 1, then the counter selected is
   a) counter 0 b) counter 1 c) counter 2 d) none

8) Single stepping is useful for
   a) I/O interfacing b) debugging
   c) wait state d) slower memory interfacing

9) Which stack is used in 8085 ?
   a) FIFO b) LIFO
   c) Random access d) None of above

10) The instruction "LXI H, 9000" requires _____ T-states.
   a) 13 b) 7 c) 10 d) 18

11) DAA stands for
   a) Decimal Adjust Accumulator b) Direct Adjust Address
   c) Decimal Adjust Address d) Direct Adjust Accumulator

12) The memory map of a 2 KB memory begins at the location 4000 H. What is the last location on the chip ?
   a) 43FFH b) 4FFFH c) 47FFH d) 7FFFH

13) Serial input data of 8085 can be loaded into bit 7 of the accumulator by
   a) executing a RIM instruction b) executing RST1
   c) using TRAP d) none of the above

14) Shadow Address will exist in
   a) absolute decoding b) linear decoding
   c) partial decoding d) none of the above

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SLR-VB – 139

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

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

SECTION – I

2. Answer **any four** : **(4×4=16)**

a) Explain how information is stored and retrieved from stack using PUSH and POP and the stack pointer.

b) Write a program to find largest number from a given array of 10 elements.

c) Write a program for division of two 8-bit hex numbers.

d) Explain single cycle and single stepping.

e) Differentiate absolute and linear address decoding.

3. Answer **any two** : **(2×6=12)**

a) Design a 8085 microprocessor based system with 4 KB EPROM having a word length of 8-bits with the starting address of 0000H and two 2KB RAMs having word lengths of 8-bits each with starting address of 4000H and 8000h respectively.

b) Draw and explain interrupt structure in 8085.

c) Write a program to convert 8 bit hex number to BCD. Explain the key instructions used in the program.

SECTION – II

4. Answer **any four** : **(4×4=16)**

   a) Explain mode of operations of 8253.

   b) Interface 8255 to the 8085 in I/O mapped I/O with address 40h.

   c) Write a program to transfer a character through SOD pin of 8085.

   d) Draw and explain Flash type ADC.

   e) Draw timing diagram for the instruction : 6780 : OUT 40h.

5. Answer **any two** : **(2×6=12)**

   a) Interface stepper motor to 8085. Write a program to run stepper motor for two revolution.

   b) Explain the mode and command words of 8251.

   c) Interface two digit seven segment display to 8085 and write a program to display BCD numbers from 00 to 99.

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SLR-VB – 139

Seat No.	

Set R

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

Day and Date : Saturday, 6-5-2017 Total Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) ***Assume*** *suitable data* ***wherever*** *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 memory map of a 2 KB memory begins at the location 4000 H. What is the last location on the chip ?
a) 43FFH b) 4FFFH c) 47FFH d) 7FFFH

2) Serial input data of 8085 can be loaded into bit 7 of the accumulator by
a) executing a RIM instruction b) executing RST1
c) using TRAP d) none of the above

3) Shadow Address will exist in
a) absolute decoding b) linear decoding
c) partial decoding d) none of the above

4) IO mode, mode 1 uses _____ for handshaking signals.
a) Port A b) Port B c) Port C d) Port D

5) _____ can be used as an output port.
a) Buffer b) Latch c) Decoder d) Encoder

6) For DAC 0808, the output _____ is proportional to input digital count.
a) Voltage b) Current
c) Resistance d) Voltage and Current

P.T.O.

7) What is RIM ?
   a) Read Interrupt Mask b) Read Interrupt Memory
   c) Read Input Memory d) None of the above

8) Control register and status register of 8251 are having the _____ address and are _____ respectively.
   a) Different, read and write b) Different, write and read
   c) Same, write and read d) Same, read and write

9) RS 232 standard is defined for
   a) Parallel communication b) Serial communication
   c) Both a) and b) d) None of the above

10) In 8251 control word register, if SC1 = 0 and SC0 = 1, then the counter selected is
   a) counter 0 b) counter 1 c) counter 2 d) none

11) Single stepping is useful for
   a) I/O interfacing b) debugging
   c) wait state d) slower memory interfacing

12) Which stack is used in 8085 ?
   a) FIFO b) LIFO
   c) Random access d) None of above

13) The instruction “LXI H, 9000” requires _____ T-states.
   a) 13 b) 7 c) 10 d) 18

14) DAA stands for
   a) Decimal Adjust Accumulator b) Direct Adjust Address
   c) Decimal Adjust Address d) Direct Adjust Accumulator

_____

SLR-VB – 139

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

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

SECTION – I

2. Answer **any four** : **(4×4=16)**

a) Explain how information is stored and retrieved from stack using PUSH and POP and the stack pointer.

b) Write a program to find largest number from a given array of 10 elements.

c) Write a program for division of two 8-bit hex numbers.

d) Explain single cycle and single stepping.

e) Differentiate absolute and linear address decoding.

3. Answer **any two** : **(2×6=12)**

a) Design a 8085 microprocessor based system with 4 KB EPROM having a word length of 8-bits with the starting address of 0000H and two 2KB RAMs having word lengths of 8-bits each with starting address of 4000H and 8000h respectively.

b) Draw and explain interrupt structure in 8085.

c) Write a program to convert 8 bit hex number to BCD. Explain the key instructions used in the program.

SECTION – II

4. Answer **any four** : **(4×4=16)**

   a) Explain mode of operations of 8253.

   b) Interface 8255 to the 8085 in I/O mapped I/O with address 40h.

   c) Write a program to transfer a character through SOD pin of 8085.

   d) Draw and explain Flash type ADC.

   e) Draw timing diagram for the instruction : 6780 : OUT 40h.

5. Answer **any two** : **(2×6=12)**

   a) Interface stepper motor to 8085. Write a program to run stepper motor for two revolution.

   b) Explain the mode and command words of 8251.

   c) Interface two digit seven segment display to 8085 and write a program to display BCD numbers from 00 to 99.

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SLR-VB – 139

Seat No.	

Set S

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

Day and Date : Saturday, 6-5-2017 Total Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) ***Assume*** *suitable data* ***wherever*** *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) For DAC 0808, the output _____ is proportional to input digital count.
   a) Voltage b) Current
   c) Resistance d) Voltage and Current

2) What is RIM ?
   a) Read Interrupt Mask b) Read Interrupt Memory
   c) Read Input Memory d) None of the above

3) Control register and status register of 8251 are having the _____ address and are _____ respectively.
   a) Different, read and write b) Different, write and read
   c) Same, write and read d) Same, read and write

4) RS 232 standard is defined for
   a) Parallel communication b) Serial communication
   c) Both a) and b) d) None of the above

5) In 8251 control word register, if SC1 = 0 and SC0 = 1, then the counter selected is
   a) counter 0 b) counter 1 c) counter 2 d) none

6) Single stepping is useful for
   a) I/O interfacing b) debugging
   c) wait state d) slower memory interfacing

7) Which stack is used in 8085 ?
   a) FIFO b) LIFO
   c) Random access d) None of above

8) The instruction "LXI H, 9000" requires _____ T-states.
   a) 13 b) 7 c) 10 d) 18

9) DAA stands for
   a) Decimal Adjust Accumulator b) Direct Adjust Address
   c) Decimal Adjust Address d) Direct Adjust Accumulator

10) The memory map of a 2 KB memory begins at the location 4000 H. What is the last location on the chip ?
   a) 43FFH b) 4FFFH c) 47FFH d) 7FFFH

11) Serial input data of 8085 can be loaded into bit 7 of the accumulator by
   a) executing a RIM instruction b) executing RST1
   c) using TRAP d) none of the above

12) Shadow Address will exist in
   a) absolute decoding b) linear decoding
   c) partial decoding d) none of the above

13) IO mode, mode 1 uses _____ for handshaking signals.
   a) Port A b) Port B c) Port C d) Port D

14) _____ can be used as an output port.
   a) Buffer b) Latch c) Decoder d) Encoder

_____

SLR-VB – 139

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

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

SECTION – I

2. Answer **any four** : **(4×4=16)**

a) Explain how information is stored and retrieved from stack using PUSH and POP and the stack pointer.

b) Write a program to find largest number from a given array of 10 elements.

c) Write a program for division of two 8-bit hex numbers.

d) Explain single cycle and single stepping.

e) Differentiate absolute and linear address decoding.

3. Answer **any two** : **(2×6=12)**

a) Design a 8085 microprocessor based system with 4 KB EPROM having a word length of 8-bits with the starting address of 0000H and two 2KB RAMs having word lengths of 8-bits each with starting address of 4000H and 8000h respectively.

b) Draw and explain interrupt structure in 8085.

c) Write a program to convert 8 bit hex number to BCD. Explain the key instructions used in the program.

SECTION – II

4. Answer **any four** : **(4×4=16)**

   a) Explain mode of operations of 8253.

   b) Interface 8255 to the 8085 in I/O mapped I/O with address 40h.

   c) Write a program to transfer a character through SOD pin of 8085.

   d) Draw and explain Flash type ADC.

   e) Draw timing diagram for the instruction : 6780 : OUT 40h.

5. Answer **any two** : **(2×6=12)**

   a) Interface stepper motor to 8085. Write a program to run stepper motor for two revolution.

   b) Explain the mode and command words of 8251.

   c) Interface two digit seven segment display to 8085 and write a program to display BCD numbers from 00 to 99.

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SLR-VB – 140

Seat No.	

Set **P**

T. E. (Part – I) (Electronics Engineering) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

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 alternative : **14**

1) $\int (\nabla \times H)$. dS is

a) Zero b) $I_{enclosed}$ c) J d) $\int H . dS$

2) The unit of scalar magnetic potential is
a) Amperes b) Volts c) Amperes/meter d) Volts/meter

3) $\nabla \times A$ is equal to
a) H b) B c) J d) Zero

4) If the direction of Coloumb's Force on a unit charge is a_x, the direction of electric field is
a) a_y b) $-a_x$ c) a_z d) a_x

5) Potential at all points on the surface of a conductor is
a) Same b) Infinity c) Not same d) Zero

6) Divergence Theorem is applicable for a _____ that is bounded by a _____
a) Volume, surface b) Surface, volume
c) Surface, line d) Line, surface

7) Curl measures
a) Rate of change of vector b) Circular rotation
c) Both a) and b) d) None of these

P.T.O.

8) Ampere's Circuital Law is analogous to _____ Law in electrostatics.
   a) Lenz's b) Gauss's
   c) Biot-Savart's d) Faraday's

9) Maxwell's equations in _____ form give information at points of discontinuity in electromagnetic fields.
   a) Differential b) Integral
   c) Algebraic d) None of these

10) Phase velocity is given as
   a) $\omega\beta$ b) $\beta\omega$
   c) β / ω d) None of these

11) For a good conductor
   a) $\frac{\sigma}{\omega \in} = 0$ b) $\frac{\sigma}{\omega \in} \langle\langle 1$ c) $\frac{\sigma}{\omega \in} \rangle\rangle 1$ d) $\frac{\sigma}{\omega \in} = \infty$

12) Standing wave consists of two travelling waves of _____ amplitudes and _____ in direction.
   a) Unequal, same b) Unequal, opposite
   c) Equal, same d) Equal, opposite

13) Transmission coefficient in Voltage is given as
   a) $\frac{\eta_1}{\eta_1 + \eta_2}$ b) $\frac{2\eta_2}{\eta_1 + \eta_2}$ c) $\frac{\eta_1 + \eta_2}{2\eta_2}$ d) $\frac{\eta_1 + \eta_2}{2\eta_1}$

14) If antenna directivity and antenna gain are equal, then antenna efficiency is _____ %.
   a) 20 b) 50 c) 75 d) 100

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SLR-VB – 140

Seat No.	

T. E. (Part – I) (Electronics Engineering) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

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. Answer **any four** questions : **(4×4=16)**

a) Given $A = 2\hat{a}x + 4\hat{a}y$ and $B = 6\hat{a}x - 4\hat{a}z$. Find the Smaller angle between them using Cross product.

b) State and explain Biot Savarts law.

c) Point charge of $+3\,\mu C$ and $-3\,\mu C$ located at (0, 0, 1) mm and (0,0, – 1) mm respectively. Find E at (1, 2, 1.5) mm.

d) Explain differential components for cylindrical system.

e) Derive the Lorentz's force equation for moving charges.

3. Answer **any two** questions : **(6×2=12)**

a) Derive the expression for Electric field intensity due to infinite line charge.

b) State and explain point form of Ampere's Law.

c) Let $E = \left(\frac{-6y}{x^2}\right)\vec{a}_x + \left(\frac{6}{x}\right)\vec{a}_y + 5a_z$, V/m and calculate

a) V_{PQ} given P(–7, 2, 1) and Q(4, 1, 2)

b) V_P if V = 0 at (2, 0, –1).

SECTION – II

4. Answer **any four** questions : **(4×4=16)**

   a) State the Maxwell's Equation in integral and point form derived from Faradays Law.

   b) Define the term displacement current and conduction current.

   c) Derive the transmission line equation stating with field theory.

   d) Define Directive Gain and Directivity of antenna.

   e) Explain the term skin depth.

5. Answer **any two** questions : **(6×2=12)**

   a) A lossless 100 Ω transmission line is terminated in 200 + j 200 Ω . Find
      i) Voltage reflection coefficient.
      ii) VSWR.
      iii) Impedance at 0.375 λ from load.
      iv) Shortest length of line for which impedance is purely resistive for 15V applied to the line.
      v) The value of this resistance.

   b) State and derive poynting theorem and give its significance.

   c) Derive the equation for reflection coefficient and transmission coefficient by perfect dielectric medium for normal incidence.

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SLR-VB – 140

Seat No.	

Set Q

T. E. (Part – I) (Electronics Engineering) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

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 alternative : **14**

1) Ampere's Circuital Law is analogous to _____ Law in electrostatics.
   a) Lenz's b) Gauss's
   c) Biot-Savart's d) Faraday's

2) Maxwell's equations in _____ form give information at points of discontinuity in electromagnetic fields.
   a) Differential b) Integral
   c) Algebraic d) None of these

3) Phase velocity is given as
   a) $\omega\beta$ b) $\beta\omega$
   c) β / ω d) None of these

4) For a good conductor
   a) $\frac{\sigma}{\omega \in} = 0$ b) $\frac{\sigma}{\omega \in} \langle\langle 1$ c) $\frac{\sigma}{\omega \in} \rangle\rangle 1$ d) $\frac{\sigma}{\omega \in} = \infty$

5) Standing wave consists of two travelling waves of _____ amplitudes and _____ in direction.
   a) Unequal, same b) Unequal, opposite
   c) Equal, same d) Equal, opposite

P.T.O.

6) Transmission coefficient in Voltage is given as

a) $\frac{\eta_1}{\eta_1 + \eta_2}$ b) $\frac{2\eta_2}{\eta_1 + \eta_2}$ c) $\frac{\eta_1 + \eta_2}{2\eta_2}$ d) $\frac{\eta_1 + \eta_2}{2\eta_1}$

7) If antenna directivity and antenna gain are equal, then antenna efficiency is _____%.

a) 20 b) 50 c) 75 d) 100

8) $\int (\nabla \times H)$. dS is

a) Zero b) $I_{enclosed}$ c) J d) $\int H . dS$

9) The unit of scalar magnetic potential is

a) Amperes b) Volts c) Amperes/meter d) Volts/meter

10) $\nabla \times A$ is equal to

a) H b) B c) J d) Zero

11) If the direction of Coloumb's Force on a unit charge is a_x, the direction of electric field is

a) a_y b) $-a_x$ c) a_z d) a_x

12) Potential at all points on the surface of a conductor is

a) Same b) Infinity c) Not same d) Zero

13) Divergence Theorem is applicable for a _____ that is bounded by a _____

a) Volume, surface b) Surface, volume
c) Surface, line d) Line, surface

14) Curl measures

a) Rate of change of vector b) Circular rotation
c) Both a) and b) d) None of these

_____

SLR-VB – 140

Seat No.	

T. E. (Part – I) (Electronics Engineering) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

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. Answer **any four** questions : **(4×4=16)**

a) Given $A = 2\hat{a}x + 4\hat{a}y$ and $B = 6\hat{a}x - 4\hat{a}z$. Find the Smaller angle between them using Cross product.

b) State and explain Biot Savarts law.

c) Point charge of $+3\,\mu C$ and $-3\,\mu C$ located at (0, 0, 1) mm and (0,0, – 1) mm respectively. Find E at (1, 2, 1.5) mm.

d) Explain differential components for cylindrical system.

e) Derive the Lorentz's force equation for moving charges.

3. Answer **any two** questions : **(6×2=12)**

a) Derive the expression for Electric field intensity due to infinite line charge.

b) State and explain point form of Ampere's Law.

c) Let $E = \left(\frac{-6y}{x^2}\right)\vec{a}_x + \left(\frac{6}{x}\right)\vec{a}_y + 5a_z$, V/m and calculate

a) V_{PQ} given P(–7, 2, 1) and Q(4, 1, 2)

b) V_P if V = 0 at (2, 0, –1).

SECTION – II

4. Answer **any four** questions : **(4×4=16)**

   a) State the Maxwell's Equation in integral and point form derived from Faradays Law.

   b) Define the term displacement current and conduction current.

   c) Derive the transmission line equation stating with field theory.

   d) Define Directive Gain and Directivity of antenna.

   e) Explain the term skin depth.

5. Answer **any two** questions : **(6×2=12)**

   a) A lossless 100 Ω transmission line is terminated in 200 + j 200 Ω . Find
      i) Voltage reflection coefficient.
      ii) VSWR.
      iii) Impedance at 0.375 λ from load.
      iv) Shortest length of line for which impedance is purely resistive for 15V applied to the line.
      v) The value of this resistance.

   b) State and derive poynting theorem and give its significance.

   c) Derive the equation for reflection coefficient and transmission coefficient by perfect dielectric medium for normal incidence.

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SLR-VB – 140

Seat No.	

Set R

T. E. (Part – I) (Electronics Engineering) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

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 alternative : **14**

1) Potential at all points on the surface of a conductor is
a) Same b) Infinity c) Not same d) Zero

2) Divergence Theorem is applicable for a _____ that is bounded by a _____
a) Volume, surface b) Surface, volume
c) Surface, line d) Line, surface

3) Curl measures
a) Rate of change of vector b) Circular rotation
c) Both a) and b) d) None of these

4) Ampere's Circuital Law is analogous to _____ Law in electrostatics.
a) Lenz's b) Gauss's
c) Biot-Savart's d) Faraday's

5) Maxwell's equations in _____ form give information at points of discontinuity in electromagnetic fields.
a) Differential b) Integral
c) Algebraic d) None of these

6) Phase velocity is given as
a) $\omega\beta$ b) $\beta\omega$
c) β / ω d) None of these

7) For a good conductor

a) $\frac{\sigma}{\omega \in} = 0$ b) $\frac{\sigma}{\omega \in} \langle\langle 1$ c) $\frac{\sigma}{\omega \in} \rangle\rangle 1$ d) $\frac{\sigma}{\omega \in} = \infty$

8) Standing wave consists of two travelling waves of _____ amplitudes and _____ in direction.

a) Unequal, same b) Unequal, opposite
c) Equal, same d) Equal, opposite

9) Transmission coefficient in Voltage is given as

a) $\frac{\eta_1}{\eta_1 + \eta_2}$ b) $\frac{2\eta_2}{\eta_1 + \eta_2}$ c) $\frac{\eta_1 + \eta_2}{2\eta_2}$ d) $\frac{\eta_1 + \eta_2}{2\eta_1}$

10) If antenna directivity and antenna gain are equal, then antenna efficiency is _____%.

a) 20 b) 50 c) 75 d) 100

11) $\int (\nabla \times H)$. dS is

a) Zero b) $I_{enclosed}$ c) J d) $\int H . dS$

12) The unit of scalar magnetic potential is

a) Amperes b) Volts c) Amperes/meter d) Volts/meter

13) $\nabla \times A$ is equal to

a) H b) B c) J d) Zero

14) If the direction of Coloumb's Force on a unit charge is a_x, the direction of electric field is

a) a_y b) $-a_x$ c) a_z d) a_x

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SLR-VB – 140

Seat No.	

T. E. (Part – I) (Electronics Engineering) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

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. Answer **any four** questions : **(4×4=16)**

a) Given $A = 2\hat{a}x + 4\hat{a}y$ and $B = 6\hat{a}x - 4\hat{a}z$. Find the Smaller angle between them using Cross product.

b) State and explain Biot Savarts law.

c) Point charge of $+3\,\mu C$ and $-3\,\mu C$ located at (0, 0, 1) mm and (0,0, – 1) mm respectively. Find E at (1, 2, 1.5) mm.

d) Explain differential components for cylindrical system.

e) Derive the Lorentz's force equation for moving charges.

3. Answer **any two** questions : **(6×2=12)**

a) Derive the expression for Electric field intensity due to infinite line charge.

b) State and explain point form of Ampere's Law.

c) Let $E = \left(\frac{-6y}{x^2}\right)\vec{a}_x + \left(\frac{6}{x}\right)\vec{a}_y + 5a_z$, V/m and calculate

a) V_{PQ} given P(–7, 2, 1) and Q(4, 1, 2)

b) V_P if V = 0 at (2, 0, –1).

SECTION – II

4. Answer **any four** questions : **(4×4=16)**

   a) State the Maxwell's Equation in integral and point form derived from Faradays Law.

   b) Define the term displacement current and conduction current.

   c) Derive the transmission line equation stating with field theory.

   d) Define Directive Gain and Directivity of antenna.

   e) Explain the term skin depth.

5. Answer **any two** questions : **(6×2=12)**

   a) A lossless 100 Ω transmission line is terminated in 200 + j 200 Ω . Find
      i) Voltage reflection coefficient.
      ii) VSWR.
      iii) Impedance at 0.375 λ from load.
      iv) Shortest length of line for which impedance is purely resistive for 15V applied to the line.
      v) The value of this resistance.

   b) State and derive poynting theorem and give its significance.

   c) Derive the equation for reflection coefficient and transmission coefficient by perfect dielectric medium for normal incidence.

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SLR-VB – 140

Seat No.	

Set S

T. E. (Part – I) (Electronics Engineering) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

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 alternative : **14**

1) Phase velocity is given as
   a) $\omega\beta$ b) $\beta\omega$
   c) β / ω d) None of these

2) For a good conductor
   a) $\frac{\sigma}{\omega \in} = 0$ b) $\frac{\sigma}{\omega \in} \langle\langle 1$ c) $\frac{\sigma}{\omega \in} \rangle\rangle 1$ d) $\frac{\sigma}{\omega \in} = \infty$

3) Standing wave consists of two travelling waves of _____ amplitudes and _____ in direction.
   a) Unequal, same b) Unequal, opposite
   c) Equal, same d) Equal, opposite

4) Transmission coefficient in Voltage is given as
   a) $\frac{\eta_1}{\eta_1 + \eta_2}$ b) $\frac{2\eta_2}{\eta_1 + \eta_2}$ c) $\frac{\eta_1 + \eta_2}{2\eta_2}$ d) $\frac{\eta_1 + \eta_2}{2\eta_1}$

5) If antenna directivity and antenna gain are equal, then antenna efficiency is _____ %.
   a) 20 b) 50 c) 75 d) 100

P.T.O.

6) $\int (\nabla \times H) \cdot dS$ is

a) Zero b) $I_{enclosed}$ c) J d) $\int H \cdot dS$

7) The unit of scalar magnetic potential is

a) Amperes b) Volts c) Amperes/meter d) Volts/meter

8) $\nabla \times A$ is equal to

a) H b) B c) J d) Zero

9) If the direction of Coloumb's Force on a unit charge is a_x, the direction of electric field is

a) a_y b) $-a_x$ c) a_z d) a_x

10) Potential at all points on the surface of a conductor is

a) Same b) Infinity c) Not same d) Zero

11) Divergence Theorem is applicable for a _____ that is bounded by a _____

a) Volume, surface b) Surface, volume
c) Surface, line d) Line, surface

12) Curl measures

a) Rate of change of vector b) Circular rotation
c) Both a) and b) d) None of these

13) Ampere's Circuital Law is analogous to _____ Law in electrostatics.

a) Lenz's b) Gauss's
c) Biot-Savart's d) Faraday's

14) Maxwell's equations in _____ form give information at points of discontinuity in electromagnetic fields.

a) Differential b) Integral
c) Algebraic d) None of these

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SLR-VB – 140

Seat No.	

T. E. (Part – I) (Electronics Engineering) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

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. Answer **any four** questions : **(4×4=16)**

a) Given $A = 2\hat{a}x + 4\hat{a}y$ and $B = 6\hat{a}x - 4\hat{a}z$. Find the Smaller angle between them using Cross product.

b) State and explain Biot Savarts law.

c) Point charge of $+ 3\,\mu C$ and $- 3\,\mu C$ located at (0, 0, 1) mm and (0,0, – 1) mm respectively. Find E at (1, 2, 1.5) mm.

d) Explain differential components for cylindrical system.

e) Derive the Lorentz's force equation for moving charges.

3. Answer **any two** questions : **(6×2=12)**

a) Derive the expression for Electric field intensity due to infinite line charge.

b) State and explain point form of Ampere's Law.

c) Let $E = \left(\frac{-6y}{x^2}\right)\vec{a}_x + \left(\frac{6}{x}\right)\vec{a}_y + 5a_z$, V/m and calculate

a) V_{PQ} given P(–7, 2, 1) and Q(4, 1, 2)

b) V_P if V = 0 at (2, 0, –1).

SECTION – II

4. Answer **any four** questions : **(4×4=16)**

   a) State the Maxwell's Equation in integral and point form derived from Faradays Law.

   b) Define the term displacement current and conduction current.

   c) Derive the transmission line equation stating with field theory.

   d) Define Directive Gain and Directivity of antenna.

   e) Explain the term skin depth.

5. Answer **any two** questions : **(6×2=12)**

   a) A lossless 100 Ω transmission line is terminated in 200 + j 200 Ω . Find
      i) Voltage reflection coefficient.
      ii) VSWR.
      iii) Impedance at 0.375 λ from load.
      iv) Shortest length of line for which impedance is purely resistive for 15V applied to the line.
      v) The value of this resistance.

   b) State and derive poynting theorem and give its significance.

   c) Derive the equation for reflection coefficient and transmission coefficient by perfect dielectric medium for normal incidence.

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SLR-VB – 141

Seat No.	

Set P

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Tuesday, 9-5-2017 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 option : **14**

1) SETI@home is an example of
   a) Cloud computing b) Grid computing
   c) Govt. e-commerce d) None of these

2) _____ are software systems designed to support machine to machine interaction over a network.
   a) Information technology b) Cloud computing
   c) Web services d) Apps

3) Which of below is not a function of DBMS ?
   a) Quality b) Synch c) Enrichment d) Forecasting

4) Make My Trip is an example of
   a) B2C b) B2B c) B2B2B d) B2B2C

5) Data, information and knowledge can be _____ to information system.
   a) Input b) Output
   c) Input and output d) Overhead

6) Usually strategic decisions with BI are taken by
   a) Data workers b) Lower managers
   c) Top executives d) All of these

7) Organizations doing some EC activities to support primary business in physical world are called _____ organizations.
   a) Virtual b) Brick and mortar
   c) Click and mortar d) B2B

8) _____ a is logical group of related files.
   a) Data b) Information c) Database d) Datamart

9) A typical business undergoes which of below pressure
   a) Legal b) Political c) Technological d) All of these

10) Which of below is not a major economical impact of information system on organization ?
   a) Shrink in organization size b) Change in workplace
   c) Reduction in transaction cost d) Outsourcing of services

11) The interaction between information technology and organizations is
   a) Mutual b) Complex
   c) Influenced by mediating factors d) All of these

12) Which of below is not a feature of a project ?
   a) Temporary endeavor b) Has begin and end
   c) Delivers only product d) Planned activity

13) A _____ is a product or outcome that is given to the client.
   a) Deliverable b) Milestone c) Status report d) SDLC model

14) The ten knowledge areas, each of which contains some or all of the project management processes, is called
   a) SDLC b) Management document
   c) PMBOK d) None of these

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SLR-VB – 141

Seat No.	

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Tuesday, 9-5-2017 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. Solve **any two** : **(2×6=12)**

a) With suitable example, diagram, types and advantages discuss distributed databases.

b) With suitable examples discuss different models of Business 2 Business (B2B) applications.

c) List and discuss major IT characteristics.

3. Solve **any four** : **(4×4=16)**

a) With suitable examples explain any two e-payment systems used in India.

b) With suitable example explain telecommuting.

c) Evaluate data management problems and challenges.

d) With typical example explain IT infrastructure for business application.

e) Discuss cloud computing and its types.

SECTION – II

4. Solve **any two** : **(2×6=12)**

   a) Discuss in brief any six attributes of software project.

   b) With suitable diagram explain stepwise activity planning.

   c) With suitable example explain economical impact of information system on organization.

5. Solve **any four** : **(4×4=16)**

   a) What are the activities involved in software project management.

   b) Discuss waterfall SDLC model.

   c) With suitable example elaborate the concept – 'IT flattens the organization'.

   d) Discuss any four objectives of activity planning.

   e) What are the different types of resources required for software project ?

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SLR-VB – 141

Seat No.	

Set Q

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Tuesday, 9-5-2017 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 option : **14**

1) _____ a is logical group of related files.
a) Data b) Information c) Database d) Datamart

2) A typical business undergoes which of below pressure
a) Legal b) Political c) Technological d) All of these

3) Which of below is not a major economical impact of information system on organization ?
a) Shrink in organization size b) Change in workplace
c) Reduction in transaction cost d) Outsourcing of services

4) The interaction between information technology and organizations is
a) Mutual b) Complex
c) Influenced by mediating factors d) All of these

5) Which of below is not a feature of a project ?
a) Temporary endeavor b) Has begin and end
c) Delivers only product d) Planned activity

6) A _____ is a product or outcome that is given to the client.
   a) Deliverable b) Milestone c) Status report d) SDLC model

7) The ten knowledge areas, each of which contains some or all of the project management processes, is called
   a) SDLC b) Management document
   c) PMBOK d) None of these

8) SETI@home is an example of
   a) Cloud computing b) Grid computing
   c) Govt. e-commerce d) None of these

9) _____ are software systems designed to support machine to machine interaction over a network.
   a) Information technology b) Cloud computing
   c) Web services d) Apps

10) Which of below is not a function of DBMS ?
   a) Quality b) Synch c) Enrichment d) Forecasting

11) Make My Trip is an example of
   a) B2C b) B2B c) B2B2B d) B2B2C

12) Data, information and knowledge can be _____ to information system.
   a) Input b) Output
   c) Input and output d) Overhead

13) Usually strategic decisions with BI are taken by
   a) Data workers b) Lower managers
   c) Top executives d) All of these

14) Organizations doing some EC activities to support primary business in physical world are called _____ organizations.
   a) Virtual b) Brick and mortar
   c) Click and mortar d) B2B

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SLR-VB – 141

Seat No.	

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Tuesday, 9-5-2017 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. Solve **any two** : **(2×6=12)**

a) With suitable example, diagram, types and advantages discuss distributed databases.

b) With suitable examples discuss different models of Business 2 Business (B2B) applications.

c) List and discuss major IT characteristics.

3. Solve **any four** : **(4×4=16)**

a) With suitable examples explain any two e-payment systems used in India.

b) With suitable example explain telecommuting.

c) Evaluate data management problems and challenges.

d) With typical example explain IT infrastructure for business application.

e) Discuss cloud computing and its types.

SECTION – II

4. Solve **any two** : **(2×6=12)**

   a) Discuss in brief any six attributes of software project.

   b) With suitable diagram explain stepwise activity planning.

   c) With suitable example explain economical impact of information system on organization.

5. Solve **any four** : **(4×4=16)**

   a) What are the activities involved in software project management.

   b) Discuss waterfall SDLC model.

   c) With suitable example elaborate the concept – 'IT flattens the organization'.

   d) Discuss any four objectives of activity planning.

   e) What are the different types of resources required for software project ?

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SLR-VB – 141

Seat No.	

Set R

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Tuesday, 9-5-2017 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 option : **14**

1) Data, information and knowledge can be _____ to information system.
   a) Input b) Output
   c) Input and output d) Overhead

2) Usually strategic decisions with BI are taken by
   a) Data workers b) Lower managers
   c) Top executives d) All of these

3) Organizations doing some EC activities to support primary business in physical world are called _____ organizations.
   a) Virtual b) Brick and mortar
   c) Click and mortar d) B2B

4) _____ a is logical group of related files.
   a) Data b) Information c) Database d) Datamart

5) A typical business undergoes which of below pressure
   a) Legal b) Political c) Technological d) All of these

P.T.O.

6) Which of below is not a major economical impact of information system on organization ?
   a) Shrink in organization size
   b) Change in workplace
   c) Reduction in transaction cost
   d) Outsourcing of services

7) The interaction between information technology and organizations is
   a) Mutual
   b) Complex
   c) Influenced by mediating factors
   d) All of these

8) Which of below is not a feature of a project ?
   a) Temporary endeavor
   b) Has begin and end
   c) Delivers only product
   d) Planned activity

9) A _____ is a product or outcome that is given to the client.
   a) Deliverable b) Milestone c) Status report d) SDLC model

10) The ten knowledge areas, each of which contains some or all of the project management processes, is called
   a) SDLC
   b) Management document
   c) PMBOK
   d) None of these

11) SETI@home is an example of
   a) Cloud computing
   b) Grid computing
   c) Govt. e-commerce
   d) None of these

12) _____ are software systems designed to support machine to machine interaction over a network.
   a) Information technology
   b) Cloud computing
   c) Web services
   d) Apps

13) Which of below is not a function of DBMS ?
   a) Quality b) Synch c) Enrichment d) Forecasting

14) Make My Trip is an example of
   a) B2C b) B2B c) B2B2B d) B2B2C

_____

SLR-VB – 141

Seat No.	

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Tuesday, 9-5-2017 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. Solve **any two** : **(2×6=12)**

a) With suitable example, diagram, types and advantages discuss distributed databases.

b) With suitable examples discuss different models of Business 2 Business (B2B) applications.

c) List and discuss major IT characteristics.

3. Solve **any four** : **(4×4=16)**

a) With suitable examples explain any two e-payment systems used in India.

b) With suitable example explain telecommuting.

c) Evaluate data management problems and challenges.

d) With typical example explain IT infrastructure for business application.

e) Discuss cloud computing and its types.

SECTION – II

4. Solve **any two** : **(2×6=12)**

   a) Discuss in brief any six attributes of software project.

   b) With suitable diagram explain stepwise activity planning.

   c) With suitable example explain economical impact of information system on organization.

5. Solve **any four** : **(4×4=16)**

   a) What are the activities involved in software project management.

   b) Discuss waterfall SDLC model.

   c) With suitable example elaborate the concept – 'IT flattens the organization'.

   d) Discuss any four objectives of activity planning.

   e) What are the different types of resources required for software project ?

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Seat No.	

SLR-VB – 141

Set **S**

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Tuesday, 9-5-2017 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 option : **14**

1) Which of below is not a major economical impact of information system on organization ?
   a) Shrink in organization size b) Change in workplace
   c) Reduction in transaction cost d) Outsourcing of services

2) The interaction between information technology and organizations is
   a) Mutual b) Complex
   c) Influenced by mediating factors d) All of these

3) Which of below is not a feature of a project ?
   a) Temporary endeavor b) Has begin and end
   c) Delivers only product d) Planned activity

4) A _____ is a product or outcome that is given to the client.
   a) Deliverable b) Milestone
   c) Status report d) SDLC model

5) The ten knowledge areas, each of which contains some or all of the project management processes, is called
   a) SDLC b) Management document
   c) PMBOK d) None of these

6) SETI@home is an example of
   a) Cloud computing b) Grid computing
   c) Govt. e-commerce d) None of these

7) _____ are software systems designed to support machine to machine interaction over a network.
   a) Information technology b) Cloud computing
   c) Web services d) Apps

8) Which of below is not a function of DBMS ?
   a) Quality b) Synch c) Enrichment d) Forecasting

9) Make My Trip is an example of
   a) B2C b) B2B c) B2B2B d) B2B2C

10) Data, information and knowledge can be _____ to information system.
   a) Input b) Output
   c) Input and output d) Overhead

11) Usually strategic decisions with BI are taken by
   a) Data workers b) Lower managers
   c) Top executives d) All of these

12) Organizations doing some EC activities to support primary business in physical world are called _____ organizations.
   a) Virtual b) Brick and mortar
   c) Click and mortar d) B2B

13) _____ a is logical group of related files.
   a) Data b) Information c) Database d) Datamart

14) A typical business undergoes which of below pressure
   a) Legal b) Political c) Technological d) All of these

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SLR-VB – 141

Seat No.	

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Tuesday, 9-5-2017 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. Solve **any two** : **(2×6=12)**

a) With suitable example, diagram, types and advantages discuss distributed databases.

b) With suitable examples discuss different models of Business 2 Business (B2B) applications.

c) List and discuss major IT characteristics.

3. Solve **any four** : **(4×4=16)**

a) With suitable examples explain any two e-payment systems used in India.

b) With suitable example explain telecommuting.

c) Evaluate data management problems and challenges.

d) With typical example explain IT infrastructure for business application.

e) Discuss cloud computing and its types.

SECTION – II

4. Solve **any two** : **(2×6=12)**

   a) Discuss in brief any six attributes of software project.

   b) With suitable diagram explain stepwise activity planning.

   c) With suitable example explain economical impact of information system on organization.

5. Solve **any four** : **(4×4=16)**

   a) What are the activities involved in software project management.

   b) Discuss waterfall SDLC model.

   c) With suitable example elaborate the concept – 'IT flattens the organization'.

   d) Discuss any four objectives of activity planning.

   e) What are the different types of resources required for software project ?

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SLR-VB – 143

Seat No.	

Set P

T.E. (Electronics Engineering) Part – II (New-CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Monday, 15-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicates **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 : **(1×14=14)**

1) A thread shares its resources (like data section, code section, open files, signals) with
   a) Other process similar to the one that the thread belongs to
   b) Other threads that belong to similar processes
   c) Other threads that belong to the same process
   d) All of these

2) A deadlock eventually cripples system throughput and will cause the CPU utilization to
   a) Increase b) Drop c) Stay still d) None of these

3) 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

4) The real difficulty with SJF in short term scheduling is
   a) It is too good an algorithm
   b) Knowing the length of the next CPU request
   c) It is too complex to understand
   d) None of these

5) In UNIX, the return value for the fork system call is _____ for the child process and _____ for the parent process.
   a) A negative integer, zero
   b) Zero, a negative integer
   c) Zero, a non zero integer
   d) A non zero integer, zero

6) Deadlock prevention is a set of methods
   a) to ensure that atleast one of the necessary conditions cannot hold
   b) to ensure that all of the necessary conditions do not hold
   c) to decide if the requested resources for a process have to be given or not
   d) to recover from a deadlock

7) The bounded buffer problem is also known as
   a) Readers-writers problem
   b) Dining-philosophers problem
   c) Producer-consumer problem
   d) None of these

8) _____ mode of file access is useful for immediate access to large amount of information.
   a) sequential b) direct c) index d) none of above

9) Address generated by Memory Management Unit (MMU) is known as _____ address.
   a) Logical b) Physical c) Virtual d) None of above

10) The _____ method produces largest left-over hole.
   a) First-fit b) Best-fit c) Worst-fit d) All above

11) In _____ page replacement algorithm, we replace the page that has not been used for the longest period of time.
   a) FIFO b) LRU c) Optimal d) All above

12) A process is _____ if it is spending more time in paging than executing.
   a) Sleeping b) Thrashing c) Halting d) None of above

13) In segmentation, logical address consist of two tuple
   a) <s, d> b) <p, d> c) <d, p> d) <offset, p>

14) The device driver present a uniform device access interface to the I/O subsystem.
   a) True b) False c) Can't say d) None of above

_____

SLR-VB – 143

Seat No.	

T.E. (Electronics Engineering) Part – II (New-CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Monday, 15-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) Describe the First Come First Served (FCFS) scheduling algorithm with one example.
   2) Differentiate between the following :
      i) User level threads and kernel level threads
      ii) Process and thread.
   3) Write a short note on multiprogramming operating systems.
   4) What is a process ? Describe the different fields stored in a process control block.
   5) What is deadlock ? Explain the resource allocation graph to describe deadlock.

3. Attempt **any two** : **(2×6=12)**
   1) Describe deadlock prevention method in detail.
   2) Write short note on :
      i) Semaphores ii) System calls
   3) Consider four processes P1, P2, P3, P4 and P5 with their CPU burst in milliseconds.

Process	**CPU burst time (ms)**
P1	10
P2	6
P3	4
P4	2
P5	5

   How these processes will be scheduled according to round robin with a time quantum of 4 ms and SJF scheduling algorithm ? Compute the average waiting time and average turnaround time.

SECTION – II

4. Attempt **any four** of the following : **(4×4=16)**
   1) Write a note on : Free space management.
   2) Compare Logical Vs Physical Address space.
   3) Write a note on : Kernel Data Structures.
   4) Describe the concept of demand paging.
   5) Describe the concept of demand segmentation.

5. Answer **any two** : **(2×6=12)**
   1) List and explain different File Access Methods in detail.
   2) What is paging ? Explain following terms related to paging.
      a) Paging hardware
      b) Multilevel paging
   3) Why page replacement is needed ? Explain LRU and Optimal page replacement algorithms with the help of suitable example.

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SLR-VB – 143

Seat No.	

Set **Q**

T.E. (Electronics Engineering) Part – II (New-CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Monday, 15-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicates* ***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 : **(1×14=14)**

1) _____ mode of file access is useful for immediate access to large amount of information.
a) sequential b) direct c) index d) none of above

2) Address generated by Memory Management Unit (MMU) is known as _____ address.
a) Logical b) Physical c) Virtual d) None of above

3) The _____ method produces largest left-over hole.
a) First-fit b) Best-fit c) Worst-fit d) All above

4) In _____ page replacement algorithm, we replace the page that has not been used for the longest period of time.
a) FIFO b) LRU c) Optimal d) All above

5) A process is _____ if it is spending more time in paging than executing.
a) Sleeping b) Thrashing c) Halting d) None of above

6) In segmentation, logical address consist of two tuple
a) <s, d> b) <p, d> c) <d, p> d) <offset, p>

7) The device driver present a uniform device access interface to the I/O subsystem.
a) True b) False c) Can't say d) None of above

P.T.O.

8) A thread shares its resources (like data section, code section, open files, signals) with
   a) Other process similar to the one that the thread belongs to
   b) Other threads that belong to similar processes
   c) Other threads that belong to the same process
   d) All of these

9) A deadlock eventually cripples system throughput and will cause the CPU utilization to
   a) Increase b) Drop c) Stay still d) None of these

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

11) The real difficulty with SJF in short term scheduling is
   a) It is too good an algorithm
   b) Knowing the length of the next CPU request
   c) It is too complex to understand
   d) None of these

12) In UNIX, the return value for the fork system call is _____ for the child process and _____ for the parent process.
   a) A negative integer, zero b) Zero, a negative integer
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13) Deadlock prevention is a set of methods
   a) to ensure that atleast one of the necessary conditions cannot hold
   b) to ensure that all of the necessary conditions do not hold
   c) to decide if the requested resources for a process have to be given or not
   d) to recover from a deadlock

14) The bounded buffer problem is also known as
   a) Readers-writers problem b) Dining-philosophers problem
   c) Producer-consumer problem d) None of these

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SLR-VB – 143

Seat No.	

T.E. (Electronics Engineering) Part – II (New-CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Monday, 15-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) Describe the First Come First Served (FCFS) scheduling algorithm with one example.
   2) Differentiate between the following :
      i) User level threads and kernel level threads
      ii) Process and thread.
   3) Write a short note on multiprogramming operating systems.
   4) What is a process ? Describe the different fields stored in a process control block.
   5) What is deadlock ? Explain the resource allocation graph to describe deadlock.

3. Attempt **any two** : **(2×6=12)**
   1) Describe deadlock prevention method in detail.
   2) Write short note on :
      i) Semaphores ii) System calls
   3) Consider four processes P1, P2, P3, P4 and P5 with their CPU burst in milliseconds.

Process	**CPU burst time (ms)**
P1	10
P2	6
P3	4
P4	2
P5	5

   How these processes will be scheduled according to round robin with a time quantum of 4 ms and SJF scheduling algorithm ? Compute the average waiting time and average turnaround time.

SECTION – II

4. Attempt **any four** of the following : **(4×4=16)**
   1) Write a note on : Free space management.
   2) Compare Logical Vs Physical Address space.
   3) Write a note on : Kernel Data Structures.
   4) Describe the concept of demand paging.
   5) Describe the concept of demand segmentation.

5. Answer **any two** : **(2×6=12)**
   1) List and explain different File Access Methods in detail.
   2) What is paging ? Explain following terms related to paging.
      a) Paging hardware
      b) Multilevel paging
   3) Why page replacement is needed ? Explain LRU and Optimal page replacement algorithms with the help of suitable example.

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SLR-VB – 143

Seat No.	

Set R

T.E. (Electronics Engineering) Part – II (New-CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Monday, 15-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicates* ***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 : **(1×14=14)**

1) In UNIX, the return value for the fork system call is _____ for the child process and _____ for the parent process.
   a) A negative integer, zero b) Zero, a negative integer
   c) Zero, a non zero integer d) A non zero integer, zero

2) Deadlock prevention is a set of methods
   a) to ensure that atleast one of the necessary conditions cannot hold
   b) to ensure that all of the necessary conditions do not hold
   c) to decide if the requested resources for a process have to be given or not
   d) to recover from a deadlock

3) The bounded buffer problem is also known as
   a) Readers-writers problem b) Dining-philosophers problem
   c) Producer-consumer problem d) None of these

4) _____ mode of file access is useful for immediate access to large amount of information.
   a) sequential b) direct c) index d) none of above

5) Address generated by Memory Management Unit (MMU) is known as _____ address.
   a) Logical b) Physical c) Virtual d) None of above

P.T.O.

6) The _____ method produces largest left-over hole.
   a) First-fit b) Best-fit c) Worst-fit d) All above

7) In _____ page replacement algorithm, we replace the page that has not been used for the longest period of time.
   a) FIFO b) LRU c) Optimal d) All above

8) A process is _____ if it is spending more time in paging than executing.
   a) Sleeping b) Thrashing c) Halting d) None of above

9) In segmentation, logical address consist of two tuple
   a) <s, d> b) <p, d> c) <d, p> d) <offset, p>

10) The device driver present a uniform device access interface to the I/O subsystem.
   a) True b) False c) Can't say d) None of above

11) A thread shares its resources (like data section, code section, open files, signals) with
   a) Other process similar to the one that the thread belongs to
   b) Other threads that belong to similar processes
   c) Other threads that belong to the same process
   d) All of these

12) A deadlock eventually cripples system throughput and will cause the CPU utilization to
   a) Increase b) Drop c) Stay still d) None of these

13) 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

14) The real difficulty with SJF in short term scheduling is
   a) It is too good an algorithm
   b) Knowing the length of the next CPU request
   c) It is too complex to understand
   d) None of these

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SLR-VB – 143

Seat No.	

T.E. (Electronics Engineering) Part – II (New-CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Monday, 15-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) Describe the First Come First Served (FCFS) scheduling algorithm with one example.
   2) Differentiate between the following :
      i) User level threads and kernel level threads
      ii) Process and thread.
   3) Write a short note on multiprogramming operating systems.
   4) What is a process ? Describe the different fields stored in a process control block.
   5) What is deadlock ? Explain the resource allocation graph to describe deadlock.

3. Attempt **any two** : **(2×6=12)**
   1) Describe deadlock prevention method in detail.
   2) Write short note on :
      i) Semaphores ii) System calls
   3) Consider four processes P1, P2, P3, P4 and P5 with their CPU burst in milliseconds.

Process	CPU burst time (ms)
P1	10
P2	6
P3	4
P4	2
P5	5

   How these processes will be scheduled according to round robin with a time quantum of 4 ms and SJF scheduling algorithm ? Compute the average waiting time and average turnaround time.

SECTION – II

4. Attempt **any four** of the following : **(4×4=16)**
   1) Write a note on : Free space management.
   2) Compare Logical Vs Physical Address space.
   3) Write a note on : Kernel Data Structures.
   4) Describe the concept of demand paging.
   5) Describe the concept of demand segmentation.

5. Answer **any two** : **(2×6=12)**
   1) List and explain different File Access Methods in detail.
   2) What is paging ? Explain following terms related to paging.
      a) Paging hardware
      b) Multilevel paging
   3) Why page replacement is needed ? Explain LRU and Optimal page replacement algorithms with the help of suitable example.

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SLR-VB – 143

Seat No.	

Set **S**

T.E. (Electronics Engineering) Part – II (New-CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Monday, 15-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicates* ***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 : **(1×14=14)**

1) The _____ method produces largest left-over hole.
a) First-fit b) Best-fit c) Worst-fit d) All above

2) In _____ page replacement algorithm, we replace the page that has not been used for the longest period of time.
a) FIFO b) LRU c) Optimal d) All above

3) A process is _____ if it is spending more time in paging than executing.
a) Sleeping b) Thrashing c) Halting d) None of above

4) In segmentation, logical address consist of two tuple
a) <s, d> b) <p, d> c) <d, p> d) <offset, p>

5) The device driver present a uniform device access interface to the I/O subsystem.
a) True b) False c) Can't say d) None of above

6) A thread shares its resources (like data section, code section, open files, signals) with
a) Other process similar to the one that the thread belongs to
b) Other threads that belong to similar processes
c) Other threads that belong to the same process
d) All of these

7) A deadlock eventually cripples system throughput and will cause the CPU utilization to
   a) Increase b) Drop c) Stay still d) None of these
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) The real difficulty with SJF in short term scheduling is
   a) It is too good an algorithm
   b) Knowing the length of the next CPU request
   c) It is too complex to understand
   d) None of these
10) In UNIX, the return value for the fork system call is _____ for the child process and _____ for the parent process.
   a) A negative integer, zero b) Zero, a negative integer
   c) Zero, a non zero integer d) A non zero integer, zero
11) Deadlock prevention is a set of methods
   a) to ensure that atleast one of the necessary conditions cannot hold
   b) to ensure that all of the necessary conditions do not hold
   c) to decide if the requested resources for a process have to be given or not
   d) to recover from a deadlock
12) The bounded buffer problem is also known as
   a) Readers-writers problem b) Dining-philosophers problem
   c) Producer-consumer problem d) None of these
13) _____ mode of file access is useful for immediate access to large amount of information.
   a) sequential b) direct c) index d) none of above
14) Address generated by Memory Management Unit (MMU) is known as _____ address.
   a) Logical b) Physical c) Virtual d) None of above

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SLR-VB – 143

Seat No.	

T.E. (Electronics Engineering) Part – II (New-CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Monday, 15-5-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) Describe the First Come First Served (FCFS) scheduling algorithm with one example.
   2) Differentiate between the following :
      i) User level threads and kernel level threads
      ii) Process and thread.
   3) Write a short note on multiprogramming operating systems.
   4) What is a process ? Describe the different fields stored in a process control block.
   5) What is deadlock ? Explain the resource allocation graph to describe deadlock.

3. Attempt **any two** : **(2×6=12)**
   1) Describe deadlock prevention method in detail.
   2) Write short note on :
      i) Semaphores ii) System calls
   3) Consider four processes P1, P2, P3, P4 and P5 with their CPU burst in milliseconds.

Process	**CPU burst time (ms)**
P1	10
P2	6
P3	4
P4	2
P5	5

   How these processes will be scheduled according to round robin with a time quantum of 4 ms and SJF scheduling algorithm ? Compute the average waiting time and average turnaround time.

SECTION – II

4. Attempt **any four** of the following : **(4×4=16)**
   1) Write a note on : Free space management.
   2) Compare Logical Vs Physical Address space.
   3) Write a note on : Kernel Data Structures.
   4) Describe the concept of demand paging.
   5) Describe the concept of demand segmentation.

5. Answer **any two** : **(2×6=12)**
   1) List and explain different File Access Methods in detail.
   2) What is paging ? Explain following terms related to paging.
      a) Paging hardware
      b) Multilevel paging
   3) Why page replacement is needed ? Explain LRU and Optimal page replacement algorithms with the help of suitable example.

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Seat No.	

Set P

T.E. (Electronics Engineering) (Part – II) (New CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day and Date : Wednesday, 17-5-2017 Max. Marks : 70
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 : 14

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

1) Characteristics of Matched filter are
   a) Matched filter is used to maximize signal to noise ratio even for non Gaussian noise
   b) It gives the output as signal energy in the absence of noise
   c) They are used for signal detection
   d) All of the above

2) The process of converting the analog sample into discrete form is called
   a) Modulation b) Multiplexing c) Quantization d) Sampling

3) The characteristics of compressor in μ -law companding are
   a) Continuous in nature b) Logarithmic in nature
   c) Linear in nature d) Discrete in nature

4) The error probability of a PCM is
   a) Calculated using noise and inter symbol interference
   b) Gaussian noise + error component due to inter symbol interference
   c) Calculated using power spectral density
   d) All of the above

5) For a binary symmetric channel, the random bits are given as
   a) Logic 1 given by probability P and logic 0 by (1-P)
   b) Logic 1 given by probability 1-P and logic 0 by P
   c) Logic 1 given by probability P2 and logic 0 by 1-P
   d) Logic 1 given by probability P and logic 0 by (1-P)2

6) Information rate is defined as
   a) Information per unit time
   b) Average number of bits of information per second
   c) rH
   d) All of the above

7) For hamming distance dmin and t errors in the received word, the condition to be able to correct the errors is
   a) $2t + 1 \leq dmin$ b) $2t + 2 \leq dmin$ c) $2t + 1 \leq 2dmin$ d) Both (a) and (b)

8) In Binary Phase Shift Keying system, the binary symbols 1 and 0 are represented by carrier with phase shift of
   a) $\Pi/2$ b) Π c) 2Π d) 0

9) ASK modulated signal has the bandwidth
   a) Same as the bandwidth of baseband signal
   b) Half the bandwidth of baseband signal
   c) Double the bandwidth of baseband signal
   d) None of the above

10) The probability of error of DPSK is _____ than that of BPSK.
   a) Higher b) Lower c) Same d) Not predictable

11) The Nyquist theorem
   a) Relates the conditions in time domain and frequency domain
   b) Helps in quantization
   c) Limits the bandwidth requirement
   d) Both (a) and (c)

12) Equalization in digital communication
   a) Reduces inter symbol interference
   b) Removes distortion caused due to channel
   c) Is done using linear filters
   d) All of the above

13) In On-Off keying, the carrier signal is transmitted with signal value '1' and '0' indicates
   a) No carrier b) Half the carrier amplitude
   c) Amplitude of modulating signal d) None of the above

14) For M equally likely messages, M>>1, if the rate of information R > C, the probability of error is
   a) Arbitrarily small b) Close to unity
   c) Not predictable d) Unknown

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Seat No.	

T.E. (Electronics Engineering) (Part – II) (New CGPA) Examination, 2017
DIGITAL COMMUNICATION

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

3) Assume suitable data ***if necessary****.*

SECTION – I

2. Attempt **any two** : **12**

a) What is entropy ? Derive equation for it. Discuss its dependence on probability of messages M when M = 2 and M > 2.

b) With suitable diagram explain modulator and demodulator for Delta Modulation.

c) With suitable diagram explain PWM modulator and demodulator.

3. Attempt **any four** : **16**

a) Explain natural sampling.

b) With block diagram explain sigma delta modulation.

c) In a binary PCM a ‘zero’ occurs with probability 1/4 and ‘one’ occurs with probability 3/4, calculate information carried by each bit.

d) Compare Digital communication and Analogy communication.

e) What is Aliasing and how it is reduced ?

SECTION – II

4. Attempt **any two** : **12**

   a) Explain with block diagram PSK Transmitter and Receiver.

   b) The generation matrix for (6, 3) block code is given below, find all code vectors of this code.

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

   What is the minimum distance between the code vectors ?

   How many errors can be detected ? How many errors can be correct ?

   c) With suitable waveforms explain QPSK and OQPSK.

5. Attempt **any four** : **16**

   a) Explain with block diagram QAM.

   b) Explain with block diagram DPSK modulator and demodulator.

   c) Explain frame synchronization.

   d) For Message M = [0 1 0 1] and $g(x) = 1 + x + x^3$ show a systematic (7, 4) cyclic code encoder circuit and stepwise encoding of M.

   e) Explain optimum receiver.

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Seat No.	

Set **Q**

T.E. (Electronics Engineering) (Part – II) (New CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day and Date : Wednesday, 17-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

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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=14)**

1) In Binary Phase Shift Keying system, the binary symbols 1 and 0 are represented by carrier with phase shift of
   a) $\Pi/2$ b) Π c) 2Π d) 0

2) ASK modulated signal has the bandwidth
   a) Same as the bandwidth of baseband signal
   b) Half the bandwidth of baseband signal
   c) Double the bandwidth of baseband signal
   d) None of the above

3) The probability of error of DPSK is _____ than that of BPSK.
   a) Higher b) Lower c) Same d) Not predictable

4) The Nyquist theorem
   a) Relates the conditions in time domain and frequency domain
   b) Helps in quantization
   c) Limits the bandwidth requirement
   d) Both (a) and (c)

5) Equalization in digital communication
   a) Reduces inter symbol interference
   b) Removes distortion caused due to channel
   c) Is done using linear filters
   d) All of the above

6) In On-Off keying, the carrier signal is transmitted with signal value '1' and '0' indicates
   a) No carrier
   b) Half the carrier amplitude
   c) Amplitude of modulating signal
   d) None of the above

7) For M equally likely messages, M>>1, if the rate of information R > C, the probability of error is
   a) Arbitrarily small
   b) Close to unity
   c) Not predictable
   d) Unknown

8) Characteristics of Matched filter are
   a) Matched filter is used to maximize signal to noise ratio even for non Gaussian noise
   b) It gives the output as signal energy in the absence of noise
   c) They are used for signal detection
   d) All of the above

9) The process of converting the analog sample into discrete form is called
   a) Modulation b) Multiplexing c) Quantization d) Sampling

10) The characteristics of compressor in μ -law companding are
   a) Continuous in nature
   b) Logarithmic in nature
   c) Linear in nature
   d) Discrete in nature

11) The error probability of a PCM is
   a) Calculated using noise and inter symbol interference
   b) Gaussian noise + error component due to inter symbol interference
   c) Calculated using power spectral density
   d) All of the above

12) For a binary symmetric channel, the random bits are given as
   a) Logic 1 given by probability P and logic 0 by (1-P)
   b) Logic 1 given by probability 1-P and logic 0 by P
   c) Logic 1 given by probability P2 and logic 0 by 1-P
   d) Logic 1 given by probability P and logic 0 by (1-P)2

13) Information rate is defined as
   a) Information per unit time
   b) Average number of bits of information per second
   c) rH
   d) All of the above

14) For hamming distance dmin and t errors in the received word, the condition to be able to correct the errors is
   a) $2t + 1 \leq dmin$ b) $2t + 2 \leq dmin$ c) $2t + 1 \leq 2dmin$ d) Both (a) and (b)

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Seat No.	

T.E. (Electronics Engineering) (Part – II) (New CGPA) Examination, 2017
DIGITAL COMMUNICATION

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

3) Assume suitable data ***if necessary****.*

SECTION – I

2. Attempt **any two** : **12**

a) What is entropy ? Derive equation for it. Discuss its dependence on probability of messages M when M = 2 and M > 2.

b) With suitable diagram explain modulator and demodulator for Delta Modulation.

c) With suitable diagram explain PWM modulator and demodulator.

3. Attempt **any four** : **16**

a) Explain natural sampling.

b) With block diagram explain sigma delta modulation.

c) In a binary PCM a ‘zero’ occurs with probability 1/4 and ‘one’ occurs with probability 3/4, calculate information carried by each bit.

d) Compare Digital communication and Analogy communication.

e) What is Aliasing and how it is reduced ?

SECTION – II

4. Attempt **any two** : **12**

   a) Explain with block diagram PSK Transmitter and Receiver.

   b) The generation matrix for (6, 3) block code is given below find all code vectors of this code.

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

   What is the minimum distance between the code vectors ?

   How many errors can be detected ? How many errors can be correct ?

   c) With suitable waveforms explain QPSK and OQPSK.

5. Attempt **any four** : **16**

   a) Explain with block diagram QAM.

   b) Explain with block diagram DPSK modulator and demodulator.

   c) Explain frame synchronization.

   d) For Message M = [0 1 0 1] and $g(x) = 1 + x + x^3$ show a systematic (7, 4) cyclic code encoder circuit and stepwise encoding of M.

   e) Explain optimum receiver.

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SLR-VB – 144

Seat No.	

Set **R**

T.E. (Electronics Engineering) (Part – II) (New CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day and Date : Wednesday, 17-5-2017 Max. Marks : 70
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 : 14

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

1) For a binary symmetric channel, the random bits are given as
   a) Logic 1 given by probability P and logic 0 by (1-P)
   b) Logic 1 given by probability 1-P and logic 0 by P
   c) Logic 1 given by probability P2 and logic 0 by 1-P
   d) Logic 1 given by probability P and logic 0 by (1-P)2

2) Information rate is defined as
   a) Information per unit time
   b) Average number of bits of information per second
   c) rH
   d) All of the above

3) For hamming distance dmin and t errors in the received word, the condition to be able to correct the errors is
   a) $2t + 1 \leq dmin$ b) $2t + 2 \leq dmin$ c) $2t + 1 \leq 2dmin$ d) Both (a) and (b)

4) In Binary Phase Shift Keying system, the binary symbols 1 and 0 are represented by carrier with phase shift of
   a) $\Pi/2$ b) Π c) 2Π d) 0

5) ASK modulated signal has the bandwidth
   a) Same as the bandwidth of baseband signal
   b) Half the bandwidth of baseband signal
   c) Double the bandwidth of baseband signal
   d) None of the above

P.T.O

6) The probability of error of DPSK is _____ than that of BPSK.
   a) Higher b) Lower c) Same d) Not predictable

7) The Nyquist theorem
   a) Relates the conditions in time domain and frequency domain
   b) Helps in quantization
   c) Limits the bandwidth requirement
   d) Both (a) and (c)

8) Equalization in digital communication
   a) Reduces inter symbol interference
   b) Removes distortion caused due to channel
   c) Is done using linear filters
   d) All of the above

9) In On-Off keying, the carrier signal is transmitted with signal value '1' and '0' indicates
   a) No carrier b) Half the carrier amplitude
   c) Amplitude of modulating signal d) None of the above

10) For M equally likely messages, M>>1, if the rate of information R > C, the probability of error is
   a) Arbitrarily small b) Close to unity
   c) Not predictable d) Unknown

11) Characteristics of Matched filter are
   a) Matched filter is used to maximize signal to noise ratio even for non Gaussian noise
   b) It gives the output as signal energy in the absence of noise
   c) They are used for signal detection
   d) All of the above

12) The process of converting the analog sample into discrete form is called
   a) Modulation b) Multiplexing c) Quantization d) Sampling

13) The characteristics of compressor in μ -law companding are
   a) Continuous in nature b) Logarithmic in nature
   c) Linear in nature d) Discrete in nature

14) The error probability of a PCM is
   a) Calculated using noise and inter symbol interference
   b) Gaussian noise + error component due to inter symbol interference
   c) Calculated using power spectral density
   d) All of the above

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SLR-VB – 144

Seat No.	

T.E. (Electronics Engineering) (Part – II) (New CGPA) Examination, 2017
DIGITAL COMMUNICATION

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

3) Assume suitable data ***if necessary****.*

SECTION – I

2. Attempt **any two** : **12**

a) What is entropy ? Derive equation for it. Discuss its dependence on probability of messages M when M = 2 and M > 2.

b) With suitable diagram explain modulator and demodulator for Delta Modulation.

c) With suitable diagram explain PWM modulator and demodulator.

3. Attempt **any four** : **16**

a) Explain natural sampling.

b) With block diagram explain sigma delta modulation.

c) In a binary PCM a ‘zero’ occurs with probability 1/4 and ‘one’ occurs with probability 3/4, calculate information carried by each bit.

d) Compare Digital communication and Analogy communication.

e) What is Aliasing and how it is reduced ?

SECTION – II

4. Attempt **any two** : **12**

   a) Explain with block diagram PSK Transmitter and Receiver.

   b) The generation matrix for (6, 3) block code is given below find all code vectors of this code.

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

   What is the minimum distance between the code vectors ?

   How many errors can be detected ? How many errors can be correct ?

   c) With suitable waveforms explain QPSK and OQPSK.

5. Attempt **any four** : **16**

   a) Explain with block diagram QAM.

   b) Explain with block diagram DPSK modulator and demodulator.

   c) Explain frame synchronization.

   d) For Message M = [0 1 0 1] and $g(x) = 1 + x + x^3$ show a systematic (7, 4) cyclic code encoder circuit and stepwise encoding of M.

   e) Explain optimum receiver.

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Seat No.	

Set **S**

T.E. (Electronics Engineering) (Part – II) (New CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day and Date : Wednesday, 17-5-2017 Max. Marks : 70
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 : 14

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

1) The probability of error of DPSK is _____ than that of BPSK.
a) Higher b) Lower c) Same d) Not predictable

2) The Nyquist theorem
a) Relates the conditions in time domain and frequency domain
b) Helps in quantization
c) Limits the bandwidth requirement
d) Both (a) and (c)

3) Equalization in digital communication
a) Reduces inter symbol interference
b) Removes distortion caused due to channel
c) Is done using linear filters
d) All of the above

4) In On-Off keying, the carrier signal is transmitted with signal value '1' and '0' indicates
a) No carrier b) Half the carrier amplitude
c) Amplitude of modulating signal d) None of the above

5) For M equally likely messages, M>>1, if the rate of information R > C, the probability of error is
a) Arbitrarily small b) Close to unity
c) Not predictable d) Unknown

6) Characteristics of Matched filter are
   a) Matched filter is used to maximize signal to noise ratio even for non Gaussian noise
   b) It gives the output as signal energy in the absence of noise
   c) They are used for signal detection
   d) All of the above

7) The process of converting the analog sample into discrete form is called
   a) Modulation b) Multiplexing c) Quantization d) Sampling

8) The characteristics of compressor in μ -law companding are
   a) Continuous in nature b) Logarithmic in nature
   c) Linear in nature d) Discrete in nature

9) The error probability of a PCM is
   a) Calculated using noise and inter symbol interference
   b) Gaussian noise + error component due to inter symbol interference
   c) Calculated using power spectral density
   d) All of the above

10) For a binary symmetric channel, the random bits are given as
   a) Logic 1 given by probability P and logic 0 by (1-P)
   b) Logic 1 given by probability 1-P and logic 0 by P
   c) Logic 1 given by probability P2 and logic 0 by 1-P
   d) Logic 1 given by probability P and logic 0 by (1-P)2

11) Information rate is defined as
   a) Information per unit time
   b) Average number of bits of information per second
   c) rH
   d) All of the above

12) For hamming distance dmin and t errors in the received word, the condition to be able to correct the errors is
   a) $2t + 1 \leq dmin$ b) $2t + 2 \leq dmin$ c) $2t + 1 \leq 2dmin$ d) Both (a) and (b)

13) In Binary Phase Shift Keying system, the binary symbols 1 and 0 are represented by carrier with phase shift of
   a) $\Pi/2$ b) Π c) 2Π d) 0

14) ASK modulated signal has the bandwidth
   a) Same as the bandwidth of baseband signal
   b) Half the bandwidth of baseband signal
   c) Double the bandwidth of baseband signal
   d) None of the above

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Seat No.	

T.E. (Electronics Engineering) (Part – II) (New CGPA) Examination, 2017
DIGITAL COMMUNICATION

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

3) Assume suitable data ***if necessary****.*

SECTION – I

2. Attempt **any two** : **12**

a) What is entropy ? Derive equation for it. Discuss its dependence on probability of messages M when M = 2 and M > 2.

b) With suitable diagram explain modulator and demodulator for Delta Modulation.

c) With suitable diagram explain PWM modulator and demodulator.

3. Attempt **any four** : **16**

a) Explain natural sampling.

b) With block diagram explain sigma delta modulation.

c) In a binary PCM a ‘zero’ occurs with probability 1/4 and ‘one’ occurs with probability 3/4, calculate information carried by each bit.

d) Compare Digital communication and Analogy communication.

e) What is Aliasing and how it is reduced ?

SECTION – II

4. Attempt **any two** : **12**

   a) Explain with block diagram PSK Transmitter and Receiver.

   b) The generation matrix for (6, 3) block code is given below find all code vectors of this code.

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

   What is the minimum distance between the code vectors ?

   How many errors can be detected ? How many errors can be correct ?

   c) With suitable waveforms explain QPSK and OQPSK.

5. Attempt **any four** : **16**

   a) Explain with block diagram QAM.

   b) Explain with block diagram DPSK modulator and demodulator.

   c) Explain frame synchronization.

   d) For Message M = [0 1 0 1] and $g(x) = 1 + x + x^3$ show a systematic (7, 4) cyclic code encoder circuit and stepwise encoding of M.

   e) Explain optimum receiver.

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Seat No.	

Set P

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS (New)

Day and Date : Friday, 19-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) Figures to the **right** indicate **full** marks.*
*2) **Assume** suitable data **wherever** 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 assembler of 8051 requires _____ extension file as an input.
a) hex b) asm c) obj d) bin

2) In 8051, serial communication mode 0, the baud rate will be
a) variable b) fosc/164 c) fosc/32 d) fosc/12

3) Which of the following signal(s) of 8051 must be used in accessing external data RAM ?
a) RD b) WR c) PSEN d) both a) and b)

4) A CALL instruction of 8051 is _____ byte instruction.
a) one b) two c) three d) four

5) In microcontroller and LCD interface which line will instruct the LCD that Microcontroller is sending the command ?
a) DB0 b) RW c) EN d) RS

6) In 8051 an Timer 1 interrupt vector address is of
a) 000Bh b) 001Bh c) 0013h d) 0023h

7) In 8051 an external interrupt 1 vector address is of
a) 000BH b) 001BH c) 0013H d) 0023H

8) Timer 0 of the PIC 16F877 is _____ bit, accessed as _____
a) 8, timer/counter b) 16, timer/counter
c) 8, timer d) 8, counter

9) Operating CCP2 module in PWM mode, PWM period can be set by writing to _____ register.
a) PR1 b) TMR2 c) PR2 d) CCP1RL

10) An instruction using the _____ register actually accesses the register pointed by the _____
a) FSR, INDF b) INDF, FSR c) FSR, W d) INDF, W

11) In PIC 16F877 the Timer 1 module increments on every _____ edge of the external clock input.
a) falling b) rising c) falling/rising d) none of above

12) In PIC 16F877 _____ port can be configured as parallel slave port.
a) PORT A b) PORT C c) PORT D d) PORT E

13) If IRP bit of STATUS register is cleared, then _____ will gets selected.
a) Bank 0 b) Bank 1 c) Bank 2 or 3 d) Bank 0 or 1

14) What is the address of the last location of on-chip flash program memory for PIC 16F877 ?
a) 0FFF h b) 1FFF h c) FFFF h d) 7FFF h

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SLR-VB – 145

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS (New)

Day and Date : Friday, 19-5-2017 Marks : 56

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

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

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

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) Explain the addressing modes in 8051 with suitable example.

b) Explain the different modes in serial interface of 8051.

c) Write 8051 assembly program to add two 16 bit numbers.

d) A switch is connected to P1.7. Write a program to send FFh to P2 when switch is closed else send 00h to P2.

e) Explain the use of TMOD and TCON registers in 8051.

3. Solve **any two** : **(6×2=12)**

a) Draw and explain interfacing of ADC 0808/09 to 8051. Write a program to convert analog voltage on channel 1 to digital.

b) Explain interrupt sources in 8051 with their priority, vector addresses. How to change the interrupt priority ?

c) Draw and explain interfacing of 8K × 8 Data ROM to 8051. Write an assembly program to read 30 bytes starting at 1000h.

SECTION – II

4. Solve **any four** : **(4×4=16)**
   a) Explain CPU registers in PIC 16F877.
   b) What is the use of WDT and BOR ?
   c) With block diagram explain Timer-1 module used in PIC 16F877 microcontroller.
   d) Explain 12C communication in PIC I6F877 microcontroller.
   e) Explain the compare mode using timer-1 in PIC 16F877.

5. Solve **any two** : **(6×2=12)**
   a) Draw and explain interfacing of LCD to PIC 16F877. Write a program to display "NO" on LCD.
   b) Explain PWM mode of CCP1 module in PIC. Write a program to setup the PWM operation. (Assume suitable values for Period and duty cycle)
   c) Explain the operation of parallel slave port in PIC 16F877.

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Seat No.	

Set Q

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS (New)

Day and Date : Friday, 19-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) ***Assume*** *suitable data* ***wherever*** *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) Timer 0 of the PIC 16F877 is _____ bit, accessed as _____
a) 8, timer/counter b) 16, timer/counter
c) 8, timer d) 8, counter

2) Operating CCP2 module in PWM mode, PWM period can be set by writing to _____ register.
a) PR1 b) TMR2 c) PR2 d) CCP1RL

3) An instruction using the _____ register actually accesses the register pointed by the _____
a) FSR, INDF b) INDF, FSR c) FSR, W d) INDF, W

4) In PIC 16F877 the Timer 1 module increments on every _____ edge of the external clock input.
a) falling b) rising c) falling/rising d) none of above

5) In PIC 16F877 _____ port can be configured as parallel slave port.
a) PORT A b) PORT C c) PORT D d) PORT E

6) If IRP bit of STATUS register is cleared, then _____ will gets selected.
a) Bank 0 b) Bank 1 c) Bank 2 or 3 d) Bank 0 or 1

7) What is the address of the last location of on-chip flash program memory for PIC 16F877 ?
a) 0FFF h b) 1FFF h c) FFFF h d) 7FFF h

P.T.O.

8) The assembler of 8051 requires _____ extension file as an input.
   a) hex b) asm c) obj d) bin

9) In 8051, serial communication mode 0, the baud rate will be
   a) variable b) fosc/164 c) fosc/32 d) fosc/12

10) Which of the following signal(s) of 8051 must be used in accessing external data RAM ?
   a) RD b) WR c) PSEN d) both a) and b)

11) A CALL instruction of 8051 is _____ byte instruction.
   a) one b) two c) three d) four

12) In microcontroller and LCD interface which line will instruct the LCD that Microcontroller is sending the command ?
   a) DB0 b) RW c) EN d) RS

13) In 8051 an Timer 1 interrupt vector address is of
   a) 000Bh b) 001Bh c) 0013h d) 0023h

14) In 8051 an external interrupt 1 vector address is of
   a) 000BH b) 001BH c) 0013H d) 0023H

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Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS (New)

Day and Date : Friday, 19-5-2017 Marks : 56

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

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

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

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) Explain the addressing modes in 8051 with suitable example.

b) Explain the different modes in serial interface of 8051.

c) Write 8051 assembly program to add two 16 bit numbers.

d) A switch is connected to P1.7. Write a program to send FFh to P2 when switch is closed else send 00h to P2.

e) Explain the use of TMOD and TCON registers in 8051.

3. Solve **any two** : **(6×2=12)**

a) Draw and explain interfacing of ADC 0808/09 to 8051. Write a program to convert analog voltage on channel 1 to digital.

b) Explain interrupt sources in 8051 with their priority, vector addresses. How to change the interrupt priority ?

c) Draw and explain interfacing of 8K × 8 Data ROM to 8051. Write an assembly program to read 30 bytes starting at 1000h.

SECTION – II

4. Solve **any four** : **(4×4=16)**
   a) Explain CPU registers in PIC 16F877.
   b) What is the use of WDT and BOR ?
   c) With block diagram explain Timer-1 module used in PIC 16F877 microcontroller.
   d) Explain 12C communication in PIC I6F877 microcontroller.
   e) Explain the compare mode using timer-1 in PIC 16F877.

5. Solve **any two** : **(6×2=12)**
   a) Draw and explain interfacing of LCD to PIC 16F877. Write a program to display "NO" on LCD.
   b) Explain PWM mode of CCP1 module in PIC. Write a program to setup the PWM operation. (Assume suitable values for Period and duty cycle)
   c) Explain the operation of parallel slave port in PIC 16F877.

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Seat No.	

Set R

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS (New)

Day and Date : Friday, 19-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) ***Assume*** *suitable data* ***wherever*** *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) In microcontroller and LCD interface which line will instruct the LCD that Microcontroller is sending the command ?
a) DB0 b) RW c) EN d) RS

2) In 8051 an Timer 1 interrupt vector address is of
a) 000Bh b) 001Bh c) 0013h d) 0023h

3) In 8051 an external interrupt 1 vector address is of
a) 000BH b) 001BH c) 0013H d) 0023H

4) Timer 0 of the PIC 16F877 is _____ bit, accessed as _____
a) 8, timer/counter b) 16, timer/counter
c) 8, timer d) 8, counter

5) Operating CCP2 module in PWM mode, PWM period can be set by writing to _____ register.
a) PR1 b) TMR2 c) PR2 d) CCP1RL

6) An instruction using the _____ register actually accesses the register pointed by the _____
a) FSR, INDF b) INDF, FSR c) FSR, W d) INDF, W

7) In PIC 16F877 the Timer 1 module increments on every _____ edge of the external clock input.
a) falling b) rising c) falling/rising d) none of above

P.T.O.

8) In PIC 16F877 _____ port can be configured as parallel slave port.
   a) PORT A b) PORT C c) PORT D d) PORT E

9) If IRP bit of STATUS register is cleared, then _____ will gets selected.
   a) Bank 0 b) Bank 1 c) Bank 2 or 3 d) Bank 0 or 1

10) What is the address of the last location of on-chip flash program memory for PIC 16F877 ?
   a) 0FFF h b) 1FFF h c) FFFF h d) 7FFF h

11) The assembler of 8051 requires _____ extension file as an input.
   a) hex b) asm c) obj d) bin

12) In 8051, serial communication mode 0, the baud rate will be
   a) variable b) fosc/164 c) fosc/32 d) fosc/12

13) Which of the following signal(s) of 8051 must be used in accessing external data RAM ?
   a) RD b) WR c) PSEN d) both a) and b)

14) A CALL instruction of 8051 is _____ byte instruction.
   a) one b) two c) three d) four

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SLR-VB – 145

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS (New)

Day and Date : Friday, 19-5-2017 Marks : 56

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

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

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

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) Explain the addressing modes in 8051 with suitable example.

b) Explain the different modes in serial interface of 8051.

c) Write 8051 assembly program to add two 16 bit numbers.

d) A switch is connected to P1.7. Write a program to send FFh to P2 when switch is closed else send 00h to P2.

e) Explain the use of TMOD and TCON registers in 8051.

3. Solve **any two** : **(6×2=12)**

a) Draw and explain interfacing of ADC 0808/09 to 8051. Write a program to convert analog voltage on channel 1 to digital.

b) Explain interrupt sources in 8051 with their priority, vector addresses. How to change the interrupt priority ?

c) Draw and explain interfacing of 8K × 8 Data ROM to 8051. Write an assembly program to read 30 bytes starting at 1000h.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Explain CPU registers in PIC 16F877.

   b) What is the use of WDT and BOR ?

   c) With block diagram explain Timer-1 module used in PIC 16F877 microcontroller.

   d) Explain 12C communication in PIC I6F877 microcontroller.

   e) Explain the compare mode using timer-1 in PIC 16F877.

5. Solve **any two** : **(6×2=12)**

   a) Draw and explain interfacing of LCD to PIC 16F877. Write a program to display "NO" on LCD.

   b) Explain PWM mode of CCP1 module in PIC. Write a program to setup the PWM operation. (Assume suitable values for Period and duty cycle)

   c) Explain the operation of parallel slave port in PIC 16F877.

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SLR-VB – 145

Seat No.	

Set S

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS (New)

Day and Date : Friday, 19-5-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1) Figures to the* ***right*** *indicate* ***full*** *marks.*
2) ***Assume*** *suitable data* ***wherever*** *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) An instruction using the _____ register actually accesses the register pointed by the _____
a) FSR, INDF b) INDF, FSR c) FSR, W d) INDF, W

2) In PIC 16F877 the Timer 1 module increments on every _____ edge of the external clock input.
a) falling b) rising c) falling/rising d) none of above

3) In PIC 16F877 _____ port can be configured as parallel slave port.
a) PORT A b) PORT C c) PORT D d) PORT E

4) If IRP bit of STATUS register is cleared, then _____ will gets selected.
a) Bank 0 b) Bank 1 c) Bank 2 or 3 d) Bank 0 or 1

5) What is the address of the last location of on-chip flash program memory for PIC 16F877 ?
a) 0FFF h b) 1FFF h c) FFFF h d) 7FFF h

6) The assembler of 8051 requires _____ extension file as an input.
a) hex b) asm c) obj d) bin

7) In 8051, serial communication mode 0, the baud rate will be
a) variable b) fosc/164 c) fosc/32 d) fosc/12

8) Which of the following signal(s) of 8051 must be used in accessing external data RAM ?
   a) RD b) WR c) PSEN d) both a) and b)

9) A CALL instruction of 8051 is _____ byte instruction.
   a) one b) two c) three d) four

10) In microcontroller and LCD interface which line will instruct the LCD that Microcontroller is sending the command ?
   a) DB0 b) RW c) EN d) RS

11) In 8051 an Timer 1 interrupt vector address is of
   a) 000Bh b) 001Bh c) 0013h d) 0023h

12) In 8051 an external interrupt 1 vector address is of
   a) 000BH b) 001BH c) 0013H d) 0023H

13) Timer 0 of the PIC 16F877 is _____ bit, accessed as _____
   a) 8, timer/counter b) 16, timer/counter
   c) 8, timer d) 8, counter

14) Operating CCP2 module in PWM mode, PWM period can be set by writing to _____ register.
   a) PR1 b) TMR2 c) PR2 d) CCP1RL

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SLR-VB – 145

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS (New)

Day and Date : Friday, 19-5-2017 Marks : 56

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

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

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

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) Explain the addressing modes in 8051 with suitable example.

b) Explain the different modes in serial interface of 8051.

c) Write 8051 assembly program to add two 16 bit numbers.

d) A switch is connected to P1.7. Write a program to send FFh to P2 when switch is closed else send 00h to P2.

e) Explain the use of TMOD and TCON registers in 8051.

3. Solve **any two** : **(6×2=12)**

a) Draw and explain interfacing of ADC 0808/09 to 8051. Write a program to convert analog voltage on channel 1 to digital.

b) Explain interrupt sources in 8051 with their priority, vector addresses. How to change the interrupt priority ?

c) Draw and explain interfacing of 8K × 8 Data ROM to 8051. Write an assembly program to read 30 bytes starting at 1000h.

SECTION – II

4. Solve **any four** : **(4×4=16)**
   a) Explain CPU registers in PIC 16F877.
   b) What is the use of WDT and BOR ?
   c) With block diagram explain Timer-1 module used in PIC 16F877 microcontroller.
   d) Explain 12C communication in PIC I6F877 microcontroller.
   e) Explain the compare mode using timer-1 in PIC 16F877.

5. Solve **any two** : **(6×2=12)**
   a) Draw and explain interfacing of LCD to PIC 16F877. Write a program to display "NO" on LCD.
   b) Explain PWM mode of CCP1 module in PIC. Write a program to setup the PWM operation. (Assume suitable values for Period and duty cycle)
   c) Explain the operation of parallel slave port in PIC 16F877.

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SLR-VB – 146

Seat No.	

Set P

T.E. (Electronics) (Part – II) Examination, 2017
(New CGPA)
INDUSTRIAL ELECTRONICS

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.***
*3) **All** questions are **compulsory**.*
*4) Assume suitable data **if required**.*
*5) Figures to **right** indicate maximum marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer :

1) In SCR angle of conduction can be varied by changing
   a) anode voltage b) anode current
   c) forward current rating d) gate current

2) Thyristor is a semiconductor switch which is _____ device.
   a) unilateral b) positive temperature coefficient
   c) latchproof d) bidirectional

3) R-C snubber is used in parallel with the tyristor to
   a) reduce dv/dt across it b) protect against di/dt
   c) protect over current d) trigger thyristor

4) IGBT is
   a) voltage controlled device b) latching device
   c) current controlled device d) bilateral

5) Single phase semiconverter is acts _____ quadrant converter for highly inductive load.
   a) Single b) Two c) Four d) Both a and b

6) In single phase fully controlled bridge converter with Inductive load if $\alpha = 90°$ then average dc voltage is
   a) $2\frac{Vm}{\pi}$ b) 0.636 Vm
   c) $\frac{Vm}{\sqrt{2}}$ d) 0

7) A TRIAC is effectively
   a) Antiparallel connection of two thyristors
   b) Antiparallel connection of two diodes
   c) Parallel connection of thyristor and diode
   d) Parallel connection of two thyristors

8) Fly back converter is derived from
   a) Buck converter b) Boost converter
   c) Buck boost converter d) None of above

9) In RC triggering circuit range of firing angle control is
   a) 0 to 180° b) 0 to 90° c) 90 to 180° d) 0 to 360°

10) SMPS has better efficiency than of linear regulator because power MOSFET is operated in _____ region.
   a) active b) saturation
   c) both a and b d) saturation and cut off

11) Single phase preventer circuit protects three phase AC motor against
   a) over current b) single phasing c) over voltage d) spikes in supply

12) Which device is preferred for high frequency and high insulation ?
   a) Optocoupler b) Silicon Controlled Switch
   c) Thyristor d) PUT

13) Induction heating can be employed for heating the objects of _____ materials.
   a) Only non conducting b) Only conducting
   c) Both a and b d) Plastic

14) Which of the following PNPN device has a terminal for synchronization purpose ?
   a) LASCR b) SUS
   c) GTO d) Thyristor

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SLR-VB – 146

Seat No.	

T.E. (Electronics) (Part – II) Examination, 2017
(New CGPA)
INDUSTRIAL ELECTRONICS

Day and Date : Monday, 22-5-2017 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 ***right*** *indicate maximum marks.*

SECTION – I

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

1) Explain di/dt and dv/dt protection circuits for SCR.

2) What is meant by commutation ? Explain Class C commutation circuit with associated waveforms.

3) A single phase semiconverter is connected to 220 V, 60 Hz AC supply with resistive load is 10 Ω. If average output voltage is 25% of maximum possible output voltage.

Determine

a) Firing angle
b) Vrms and Irms
c) Sketch associated voltage waveforms.

4) Describe operation of single phase dual converter for non circulating current mode of operation.

5) Why SCR's are preferred over TRIAC for highly inductive load ?

3. Attempt **any two** : **(2×6=12)**

1) Describe following methods of over voltage protections circuits

a) Non linear surge suppressor using Thyrector
b) RC snubbers circuit
c) Electronic crowbar circuit.

2) Explain the working of single phase fully controlled rectifier with resistive load. Derive an exp for average voltage and RMS Voltage for resistive load. Sketch associated waveforms for $\alpha = 30°$.

3) With help of structural diagram explain operation and switching characteristics of IGBT during turn on and turn off process.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

1) Explain operation of optical isolated driver circuit using LASCR to trigger high current SCR's.

2) What is necessity of optocoupler ? Explain its different configuration.

3) Explain working of solid state voltage stabilizer using Thyristors.

4) Explain working of boost regulator and derive an expression for its duty cycle.

5) With suitable circuit diagram explain working of battery charger circuit.

5. Attempt **any two** : **(2×6=12)**

1) Design microcontroller based firing scheme for single phase half controlled converters with suitable flow chart.

2) With suitable circuit diagram explain working of flyback converter and sketch associated waveforms.

3) Explain principle of dielectric heating. Compare Induction heating and Dielectric heating.

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SLR-VB – 146

Seat No.	

Set Q

T.E. (Electronics) (Part – II) Examination, 2017
(New CGPA)
INDUSTRIAL ELECTRONICS

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.***
*3) **All** questions are **compulsory**.*
*4) Assume suitable data **if required**.*
*5) Figures to **right** indicate maximum marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer :

1) Fly back converter is derived from
   a) Buck converter b) Boost converter
   c) Buck boost converter d) None of above

2) In RC triggering circuit range of firing angle control is
   a) 0 to 180° b) 0 to 90° c) 90 to 180° d) 0 to 360°

3) SMPS has better efficiency than of linear regulator because power MOSFET is operated in _____ region.
   a) active b) saturation
   c) both a and b d) saturation and cut off

4) Single phase preventer circuit protects three phase AC motor against
   a) over current b) single phasing c) over voltage d) spikes in supply

5) Which device is preferred for high frequency and high insulation ?
   a) Optocoupler b) Silicon Controlled Switch
   c) Thyristor d) PUT

6) Induction heating can be employed for heating the objects of _____ materials.
   a) Only non conducting b) Only conducting
   c) Both a and b d) Plastic

7) Which of the following PNPN device has a terminal for synchronization purpose ?
   a) LASCR b) SUS
   c) GTO d) Thyristor

8) In SCR angle of conduction can be varied by changing
   a) anode voltage b) anode current
   c) forward current rating d) gate current

9) Thyristor is a semiconductor switch which is _____ device.
   a) unilateral b) positive temperature coefficient
   c) latchproof d) bidirectional

10) R-C snubber is used in parallel with the tyristor to
   a) reduce dv/dt across it b) protect against di/dt
   c) protect over current d) trigger thyristor

11) IGBT is
   a) voltage controlled device b) latching device
   c) current controlled device d) bilateral

12) Single phase semiconverter is acts _____ quadrant converter for highly inductive load.
   a) Single b) Two c) Four d) Both a and b

13) In single phase fully controlled bridge converter with Inductive load if α =90° then average dc voltage is
   a) $2\frac{Vm}{\pi}$ b) 0.636 Vm
   c) $\frac{Vm}{\sqrt{2}}$ d) 0

14) A TRIAC is effectively
   a) Antiparallel connection of two thyristors
   b) Antiparallel connection of two diodes
   c) Parallel connection of thyristor and diode
   d) Parallel connection of two thyristors

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SLR-VB – 146

Seat No.	

T.E. (Electronics) (Part – II) Examination, 2017
(New CGPA)
INDUSTRIAL ELECTRONICS

Day and Date : Monday, 22-5-2017 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 ***right*** *indicate maximum marks.*

SECTION – I

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

1) Explain di/dt and dv/dt protection circuits for SCR.

2) What is meant by commutation ? Explain Class C commutation circuit with associated waveforms.

3) A single phase semiconverter is connected to 220 V, 60 Hz AC supply with resistive load is 10 Ω. If average output voltage is 25% of maximum possible output voltage.

Determine

a) Firing angle
b) Vrms and Irms
c) Sketch associated voltage waveforms.

4) Describe operation of single phase dual converter for non circulating current mode of operation.

5) Why SCR's are preferred over TRIAC for highly inductive load ?

3. Attempt **any two** : **(2×6=12)**

1) Describe following methods of over voltage protections circuits

a) Non linear surge suppressor using Thyrector
b) RC snubbers circuit
c) Electronic crowbar circuit.

2) Explain the working of single phase fully controlled rectifier with resistive load. Derive an exp for average voltage and RMS Voltage for resistive load. Sketch associated waveforms for $\alpha = 30°$.

3) With help of structural diagram explain operation and switching characteristics of IGBT during turn on and turn off process.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

1) Explain operation of optical isolated driver circuit using LASCR to trigger high current SCR's.

2) What is necessity of optocoupler ? Explain its different configuration.

3) Explain working of solid state voltage stabilizer using Thyristors.

4) Explain working of boost regulator and derive an expression for its duty cycle.

5) With suitable circuit diagram explain working of battery charger circuit.

5. Attempt **any two** : **(2×6=12)**

1) Design microcontroller based firing scheme for single phase half controlled converters with suitable flow chart.

2) With suitable circuit diagram explain working of flyback converter and sketch associated waveforms.

3) Explain principle of dielectric heating. Compare Induction heating and Dielectric heating.

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SLR-VB – 146

Seat No.	

Set R

T.E. (Electronics) (Part – II) Examination, 2017
(New CGPA)
INDUSTRIAL ELECTRONICS

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.***
*3) **All** questions are **compulsory**.*
*4) Assume suitable data **if required**.*
*5) Figures to **right** indicate maximum marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer :

1) Single phase semiconverter is acts _____ quadrant converter for highly inductive load.
a) Single b) Two c) Four d) Both a and b

2) In single phase fully controlled bridge converter with Inductive load if $\alpha = 90°$ then average dc voltage is
a) $2\frac{Vm}{\pi}$ b) 0.636 Vm
c) $\frac{Vm}{\sqrt{2}}$ d) 0

3) A TRIAC is effectively
a) Antiparallel connection of two thyristors
b) Antiparallel connection of two diodes
c) Parallel connection of thyristor and diode
d) Parallel connection of two thyristors

4) Fly back converter is derived from
a) Buck converter b) Boost converter
c) Buck boost converter d) None of above

5) In RC triggering circuit range of firing angle control is
a) 0 to 180° b) 0 to 90° c) 90 to 180° d) 0 to 360°

6) SMPS has better efficiency than of linear regulator because power MOSFET is operated in _____ region.
   a) active b) saturation
   c) both a and b d) saturation and cut off

7) Single phase preventer circuit protects three phase AC motor against
   a) over current b) single phasing c) over voltage d) spikes in supply

8) Which device is preferred for high frequency and high insulation ?
   a) Optocoupler b) Silicon Controlled Switch
   c) Thyristor d) PUT

9) Induction heating can be employed for heating the objects of _____ materials.
   a) Only non conducting b) Only conducting
   c) Both a and b d) Plastic

10) Which of the following PNPN device has a terminal for synchronization purpose ?
   a) LASCR b) SUS
   c) GTO d) Thyristor

11) In SCR angle of conduction can be varied by changing
   a) anode voltage b) anode current
   c) forward current rating d) gate current

12) Thyristor is a semiconductor switch which is _____ device.
   a) unilateral b) positive temperature coefficient
   c) latchproof d) bidirectional

13) R-C snubber is used in parallel with the tyristor to
   a) reduce dv/dt across it b) protect against di/dt
   c) protect over current d) trigger thyristor

14) IGBT is
   a) voltage controlled device b) latching device
   c) current controlled device d) bilateral

_____

SLR-VB – 146

Seat No.	

T.E. (Electronics) (Part – II) Examination, 2017
(New CGPA)
INDUSTRIAL ELECTRONICS

Day and Date : Monday, 22-5-2017 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 ***right*** *indicate maximum marks.*

SECTION – I

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

1) Explain di/dt and dv/dt protection circuits for SCR.

2) What is meant by commutation ? Explain Class C commutation circuit with associated waveforms.

3) A single phase semiconverter is connected to 220 V, 60 Hz AC supply with resistive load is 10 Ω. If average output voltage is 25% of maximum possible output voltage.

Determine

a) Firing angle
b) Vrms and Irms
c) Sketch associated voltage waveforms.

4) Describe operation of single phase dual converter for non circulating current mode of operation.

5) Why SCR's are preferred over TRIAC for highly inductive load ?

3. Attempt **any two** : **(2×6=12)**

1) Describe following methods of over voltage protections circuits

a) Non linear surge suppressor using Thyrector
b) RC snubbers circuit
c) Electronic crowbar circuit.

2) Explain the working of single phase fully controlled rectifier with resistive load. Derive an exp for average voltage and RMS Voltage for resistive load. Sketch associated waveforms for $\alpha = 30°$.

3) With help of structural diagram explain operation and switching characteristics of IGBT during turn on and turn off process.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

1) Explain operation of optical isolated driver circuit using LASCR to trigger high current SCR's.

2) What is necessity of optocoupler ? Explain its different configuration.

3) Explain working of solid state voltage stabilizer using Thyristors.

4) Explain working of boost regulator and derive an expression for its duty cycle.

5) With suitable circuit diagram explain working of battery charger circuit.

5. Attempt **any two** : **(2×6=12)**

1) Design microcontroller based firing scheme for single phase half controlled converters with suitable flow chart.

2) With suitable circuit diagram explain working of flyback converter and sketch associated waveforms.

3) Explain principle of dielectric heating. Compare Induction heating and Dielectric heating.

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SLR-VB – 146

Seat No.	

Set S

T.E. (Electronics) (Part – II) Examination, 2017
(New CGPA)
INDUSTRIAL ELECTRONICS

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.***
*3) **All** questions are **compulsory**.*
*4) Assume suitable data **if required**.*
*5) Figures to **right** indicate maximum marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer :

1) SMPS has better efficiency than of linear regulator because power MOSFET is operated in _____ region.
   a) active b) saturation
   c) both a and b d) saturation and cut off

2) Single phase preventer circuit protects three phase AC motor against
   a) over current b) single phasing c) over voltage d) spikes in supply

3) Which device is preferred for high frequency and high insulation ?
   a) Optocoupler b) Silicon Controlled Switch
   c) Thyristor d) PUT

4) Induction heating can be employed for heating the objects of _____ materials.
   a) Only non conducting b) Only conducting
   c) Both a and b d) Plastic

5) Which of the following PNPN device has a terminal for synchronization purpose ?
   a) LASCR b) SUS
   c) GTO d) Thyristor

6) In SCR angle of conduction can be varied by changing
   a) anode voltage b) anode current
   c) forward current rating d) gate current

7) Thyristor is a semiconductor switch which is _____ device.
   a) unilateral b) positive temperature coefficient
   c) latchproof d) bidirectional

8) R-C snubber is used in parallel with the tyristor to
   a) reduce dv/dt across it b) protect against di/dt
   c) protect over current d) trigger thyristor

9) IGBT is
   a) voltage controlled device b) latching device
   c) current controlled device d) bilateral

10) Single phase semiconverter is acts _____ quadrant converter for highly inductive load.
   a) Single b) Two c) Four d) Both a and b

11) In single phase fully controlled bridge converter with Inductive load if α =90° then average dc voltage is
   a) $2\frac{Vm}{\pi}$ b) 0.636 Vm
   c) $\frac{Vm}{\sqrt{2}}$ d) 0

12) A TRIAC is effectively
   a) Antiparallel connection of two thyristors
   b) Antiparallel connection of two diodes
   c) Parallel connection of thyristor and diode
   d) Parallel connection of two thyristors

13) Fly back converter is derived from
   a) Buck converter b) Boost converter
   c) Buck boost converter d) None of above

14) In RC triggering circuit range of firing angle control is
   a) 0 to 180° b) 0 to 90° c) 90 to 180° d) 0 to 360°

SLR-VB – 146

Seat No.	

T.E. (Electronics) (Part – II) Examination, 2017
(New CGPA)
INDUSTRIAL ELECTRONICS

Day and Date : Monday, 22-5-2017 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 ***right*** *indicate maximum marks.*

SECTION – I

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

1) Explain di/dt and dv/dt protection circuits for SCR.

2) What is meant by commutation ? Explain Class C commutation circuit with associated waveforms.

3) A single phase semiconverter is connected to 220 V, 60 Hz AC supply with resistive load is 10 Ω. If average output voltage is 25% of maximum possible output voltage.

Determine

a) Firing angle
b) Vrms and Irms
c) Sketch associated voltage waveforms.

4) Describe operation of single phase dual converter for non circulating current mode of operation.

5) Why SCR's are preferred over TRIAC for highly inductive load ?

3. Attempt **any two** : **(2×6=12)**

1) Describe following methods of over voltage protections circuits

a) Non linear surge suppressor using Thyrector
b) RC snubbers circuit
c) Electronic crowbar circuit.

2) Explain the working of single phase fully controlled rectifier with resistive load. Derive an exp for average voltage and RMS Voltage for resistive load. Sketch associated waveforms for $\alpha = 30°$.

3) With help of structural diagram explain operation and switching characteristics of IGBT during turn on and turn off process.

SECTION – II

4. Attempt **any four** : **(4×4=16)**

1) Explain operation of optical isolated driver circuit using LASCR to trigger high current SCR's.

2) What is necessity of optocoupler ? Explain its different configuration.

3) Explain working of solid state voltage stabilizer using Thyristors.

4) Explain working of boost regulator and derive an expression for its duty cycle.

5) With suitable circuit diagram explain working of battery charger circuit.

5. Attempt **any two** : **(2×6=12)**

1) Design microcontroller based firing scheme for single phase half controlled converters with suitable flow chart.

2) With suitable circuit diagram explain working of flyback converter and sketch associated waveforms.

3) Explain principle of dielectric heating. Compare Induction heating and Dielectric heating.

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SLR-VB – 147

Seat No.	

Set P

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (New CGPA)

Day and Date : Wednesday, 24-5-2017 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 necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) In a VHDL code, statements that are placed inside _____ are executed sequentially.
a) Entity b) Library c) Process d) With-select

2) Consider the VHDL statement C = 5, C is a signal object. This is a
a) Variable assignment statement b) Signal assignment statement
c) Constant assignment statement d) None of these

3) The VHDL statement clk <= not clk after 4 ns generates a clk with duty cycle
a) 4% b) 50% c) 96% d) None of these

4) _____ delay model models the delays often found in switching circuits.
a) Transport b) Inertial c) Delta d) None of these

5) A process cannot have a sensitivity list when _____ is employed.
a) Loop b) Generate c) If d) Wait

6) When the following signal assignment statement executes at 5 ns, the new value will be assigned to signal at what time ?

X <= 4 after 5 ns;
a) 10 ns; b) 10ns + Δ c) 5 ns d) 5 ns + Δ

7) The design unit used for storage of common declarations are
a) configuration declarations b) package body
c) package declarations d) none of these

P.T.O.

8) The CPLD contains several PLD blocks and
   a) AND-OR arrays
   b) A language compiler
   c) Field programmable switches
   d) A global interconnect matrix

9) Input Resistance of CMOS Inverter is
   a) Extremely Low
   b) Extremely High
   c) Infinity
   d) Zero

10) Synthesis means
   a) Checking correctness of the design
   b) Conversion of the design to actual component
   c) Implement design into target technology
   d) None of above

11) A single pattern that may be interpreted as a result of all the applied tests in testing is
   a) MIC b) PRBSG c) SIC d) Signature

12) RTL simulation does
   a) Preparation of net lists
   b) Verifying correctness
   c) Preparing timing analysis
   d) None of above

13) Under steady state condition power dissipated in CMOS circuit is
   a) 0 w b) 10 μw c) 0.1 μw d) None of above

14) CMOS logic consists of
   a) Pull up network
   b) Pull down network
   c) Both a) and b)
   d) None of above

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SLR-VB – 147

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (New CGPA)

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) Draw the waveform generated on A with following statement is executed at 0 ns.
A<= '0', 1 after 5 ns, '0' after 9 ns, '1' after 15 ns, '0' after 21 ns, '1' after 24 ns;

Draw the waveforms on B & C considering following statements.

1) B <= reject 3 ns A after 5 ns;

2) C <= transport A after 5 ns;

b) What is package in VHDL ? Explain package declaration and package body associated with it with suitable example.

c) Write VHDL code for 2 : 4 decoder with active low enable using behavioral Architecture.

d) Write VHDL test bench for testing half adder.

e) Write VHDL code for JK flip flop with synchronous reset.

3. Solve **any two**. **(2×6=12)**

a) Write VHDL code for 6 bit serial in serial out shift register.

b) In the following VHDL code A, B, C, D are bit signals that are '0' at time = 3 ns. If A changes to '1' at time 5 ns, make a table showing the values of A, B, C and D as a

function of time until time = 20 ns. Include deltas. Indicate the times at which each process begins executing.

```
P1: process(A)
  begin
     B <= A after 5 ns;
     C <= B after 3 ns;
  end process P1;
 P2: process
  begin
        wait on B;
        A <= not B;
        D <= not A xor B;
  end process P2;
```

c) Write VHDL code for a Moore FSM to detect the sequence 101 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

SECTION – II

4. Solve **any four**. **(4×4=16)**

a) Explain the architecture of macrocell in Xilinx 9500 series CPLD.

b) Explain the difference between functional simulation and timing simulation.

c) Derive a CMOS complex gate for following logic functions

$f = \overline{x_1} + \overline{x_2}\ \overline{x_3}$.

d) Explain place and route process of EDA tools.

e) What is transmission gate ? Write its advantages.

5. Solve **any two**. **(6×2=12)**

a) Draw and explain Xilinx Spartan 4000 FPGA architecture.

b) Explain in detail boundary scan test.

c) Draw and explain the different regions of operation of CMOS Inverter.

SLR-VB – 147

Seat No.	

Set Q

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (New CGPA)

Day and Date : Wednesday, 24-5-2017 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 necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The CPLD contains several PLD blocks and
   a) AND-OR arrays b) A language compiler
   c) Field programmable switches d) A global interconnect matrix

2) Input Resistance of CMOS Inverter is
   a) Extremely Low b) Extremely High
   c) Infinity d) Zero

3) Synthesis means
   a) Checking correctness of the design
   b) Conversion of the design to actual component
   c) Implement design into target technology
   d) None of above

4) A single pattern that may be interpreted as a result of all the applied tests in testing is
   a) MIC b) PRBSG c) SIC d) Signature

5) RTL simulation does
   a) Preparation of net lists b) Verifying correctness
   c) Preparing timing analysis d) None of above

6) Under steady state condition power dissipated in CMOS circuit is
   a) 0 w b) 10 μw c) 0.1 μw d) None of above

P.T.O.

7) CMOS logic consists of
   a) Pull up network
   b) Pull down network
   c) Both a) and b)
   d) None of above

8) In a VHDL code, statements that are placed inside _____ are executed sequentially.
   a) Entity
   b) Library
   c) Process
   d) With-select

9) Consider the VHDL statement C = 5, C is a signal object. This is a
   a) Variable assignment statement
   b) Signal assignment statement
   c) Constant assignment statement
   d) None of these

10) The VHDL statement clk <= not clk after 4 ns generates a clk with duty cycle
   a) 4%
   b) 50%
   c) 96%
   d) None of these

11) _____ delay model models the delays often found in switching circuits.
   a) Transport
   b) Inertial
   c) Delta
   d) None of these

12) A process cannot have a sensitivity list when _____ is employed.
   a) Loop
   b) Generate
   c) If
   d) Wait

13) When the following signal assignment statement executes at 5 ns, the new value will be assigned to signal at what time ?

   X <= 4 after 5 ns;
   a) 10 ns;
   b) 10ns + Δ
   c) 5 ns
   d) 5 ns + Δ

14) The design unit used for storage of common declarations are
   a) configuration declarations
   b) package body
   c) package declarations
   d) none of these

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SLR-VB – 147

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (New CGPA)

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) Draw the waveform generated on A with following statement is executed at 0 ns.
A<= '0', 1 after 5 ns, '0' after 9 ns, '1' after 15 ns, '0' after 21 ns, '1' after 24 ns;

Draw the waveforms on B & C considering following statements.

1) B <= reject 3 ns A after 5 ns;

2) C <= transport A after 5 ns;

b) What is package in VHDL ? Explain package declaration and package body associated with it with suitable example.

c) Write VHDL code for 2 : 4 decoder with active low enable using behavioral Architecture.

d) Write VHDL test bench for testing half adder.

e) Write VHDL code for JK flip flop with synchronous reset.

3. Solve **any two**. **(2×6=12)**

a) Write VHDL code for 6 bit serial in serial out shift register.

b) In the following VHDL code A, B, C, D are bit signals that are '0' at time = 3 ns. If A changes to '1' at time 5 ns, make a table showing the values of A, B, C and D as a

function of time until time = 20 ns. Include deltas. Indicate the times at which each process begins executing.

```
P1: process(A)
  begin
     B <= A after 5 ns;
     C <= B after 3 ns;
  end process P1;
 P2: process
  begin
        wait on B;
        A <= not B;
        D <= not A xor B;
  end process P2;
```

c) Write VHDL code for a Moore FSM to detect the sequence 101 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

SECTION – II

4. Solve **any four**. **(4×4=16)**

a) Explain the architecture of macrocell in Xilinx 9500 series CPLD.

b) Explain the difference between functional simulation and timing simulation.

c) Derive a CMOS complex gate for following logic functions

$f = \overline{x_1} + \overline{x_2}\ \overline{x_3}$.

d) Explain place and route process of EDA tools.

e) What is transmission gate ? Write its advantages.

5. Solve **any two**. **(6×2=12)**

a) Draw and explain Xilinx Spartan 4000 FPGA architecture.

b) Explain in detail boundary scan test.

c) Draw and explain the different regions of operation of CMOS Inverter.

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SLR-VB – 147

Seat No.	

Set R

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (New CGPA)

Day and Date : Wednesday, 24-5-2017 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 necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) A process cannot have a sensitivity list when _____ is employed.
a) Loop b) Generate c) If d) Wait

2) When the following signal assignment statement executes at 5 ns, the new value will be assigned to signal at what time ?

X <= 4 after 5 ns;
a) 10 ns; b) 10ns + Δ c) 5 ns d) 5 ns + Δ

3) The design unit used for storage of common declarations are
a) configuration declarations b) package body
c) package declarations d) none of these

4) The CPLD contains several PLD blocks and
a) AND-OR arrays b) A language compiler
c) Field programmable switches d) A global interconnect matrix

5) Input Resistance of CMOS Inverter is
a) Extremely Low b) Extremely High
c) Infinity d) Zero

6) Synthesis means
a) Checking correctness of the design
b) Conversion of the design to actual component
c) Implement design into target technology
d) None of above

P.T.O.

7) A single pattern that may be interpreted as a result of all the applied tests in testing is
   a) MIC b) PRBSG c) SIC d) Signature

8) RTL simulation does
   a) Preparation of net lists b) Verifying correctness
   c) Preparing timing analysis d) None of above

9) Under steady state condition power dissipated in CMOS circuit is
   a) 0 w b) 10 μw c) 0.1 μw d) None of above

10) CMOS logic consists of
   a) Pull up network b) Pull down network
   c) Both a) and b) d) None of above

11) In a VHDL code, statements that are placed inside _____ are executed sequentially.
   a) Entity b) Library c) Process d) With-select

12) Consider the VHDL statement C = 5, C is a signal object. This is a
   a) Variable assignment statement b) Signal assignment statement
   c) Constant assignment statement d) None of these

13) The VHDL statement clk <= not clk after 4 ns generates a clk with duty cycle
   a) 4% b) 50% c) 96% d) None of these

14) _____ delay model models the delays often found in switching circuits.
   a) Transport b) Inertial c) Delta d) None of these

_____

SLR-VB – 147

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (New CGPA)

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) Draw the waveform generated on A with following statement is executed at 0 ns.
A<= '0', 1 after 5 ns, '0' after 9 ns, '1' after 15 ns, '0' after 21 ns, '1' after 24 ns;

Draw the waveforms on B & C considering following statements.

1) B <= reject 3 ns A after 5 ns;

2) C <= transport A after 5 ns;

b) What is package in VHDL ? Explain package declaration and package body associated with it with suitable example.

c) Write VHDL code for 2 : 4 decoder with active low enable using behavioral Architecture.

d) Write VHDL test bench for testing half adder.

e) Write VHDL code for JK flip flop with synchronous reset.

3. Solve **any two**. **(2×6=12)**

a) Write VHDL code for 6 bit serial in serial out shift register.

b) In the following VHDL code A, B, C, D are bit signals that are '0' at time = 3 ns. If A changes to '1' at time 5 ns, make a table showing the values of A, B, C and D as a

function of time until time = 20 ns. Include deltas. Indicate the times at which each process begins executing.

```
P1: process(A)
  begin
     B <= A after 5 ns;
     C <= B after 3 ns;
  end process P1;
 P2: process
  begin
        wait on B;
        A <= not B;
        D <= not A xor B;
  end process P2;
```

c) Write VHDL code for a Moore FSM to detect the sequence 101 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

SECTION – II

4. Solve **any four**. **(4×4=16)**

a) Explain the architecture of macrocell in Xilinx 9500 series CPLD.

b) Explain the difference between functional simulation and timing simulation.

c) Derive a CMOS complex gate for following logic functions

$f = \overline{x_1} + \overline{x_2}\ \overline{x_3}$.

d) Explain place and route process of EDA tools.

e) What is transmission gate ? Write its advantages.

5. Solve **any two**. **(6×2=12)**

a) Draw and explain Xilinx Spartan 4000 FPGA architecture.

b) Explain in detail boundary scan test.

c) Draw and explain the different regions of operation of CMOS Inverter.

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SLR-VB – 147

Seat No.	

Set S

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (New CGPA)

Day and Date : Wednesday, 24-5-2017 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 necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Synthesis means
   a) Checking correctness of the design
   b) Conversion of the design to actual component
   c) Implement design into target technology
   d) None of above

2) A single pattern that may be interpreted as a result of all the applied tests in testing is
   a) MIC b) PRBSG c) SIC d) Signature

3) RTL simulation does
   a) Preparation of net lists b) Verifying correctness
   c) Preparing timing analysis d) None of above

4) Under steady state condition power dissipated in CMOS circuit is
   a) 0 w b) 10 μw c) 0.1 μw d) None of above

5) CMOS logic consists of
   a) Pull up network b) Pull down network
   c) Both a) and b) d) None of above

6) In a VHDL code, statements that are placed inside _____ are executed sequentially.
   a) Entity b) Library c) Process d) With-select

P.T.O.

7) Consider the VHDL statement C = 5, C is a signal object. This is a
   a) Variable assignment statement b) Signal assignment statement
   c) Constant assignment statement d) None of these

8) The VHDL statement clk <= not clk after 4 ns generates a clk with duty cycle
   a) 4% b) 50% c) 96% d) None of these

9) _____ delay model models the delays often found in switching circuits.
   a) Transport b) Inertial c) Delta d) None of these

10) A process cannot have a sensitivity list when _____ is employed.
   a) Loop b) Generate c) If d) Wait

11) When the following signal assignment statement executes at 5 ns, the new value will be assigned to signal at what time ?

   X <= 4 after 5 ns;
   a) 10 ns; b) 10ns + Δ c) 5 ns d) 5 ns + Δ

12) The design unit used for storage of common declarations are
   a) configuration declarations b) package body
   c) package declarations d) none of these

13) The CPLD contains several PLD blocks and
   a) AND-OR arrays b) A language compiler
   c) Field programmable switches d) A global interconnect matrix

14) Input Resistance of CMOS Inverter is
   a) Extremely Low b) Extremely High
   c) Infinity d) Zero

SLR-VB – 147

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (New CGPA)

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) Draw the waveform generated on A with following statement is executed at 0 ns.
A<= '0', 1 after 5 ns, '0' after 9 ns, '1' after 15 ns, '0' after 21 ns, '1' after 24 ns;

Draw the waveforms on B & C considering following statements.

1) B <= reject 3 ns A after 5 ns;

2) C <= transport A after 5 ns;

b) What is package in VHDL ? Explain package declaration and package body associated with it with suitable example.

c) Write VHDL code for 2 : 4 decoder with active low enable using behavioral Architecture.

d) Write VHDL test bench for testing half adder.

e) Write VHDL code for JK flip flop with synchronous reset.

3. Solve **any two**. **(2×6=12)**

a) Write VHDL code for 6 bit serial in serial out shift register.

b) In the following VHDL code A, B, C, D are bit signals that are '0' at time = 3 ns. If A changes to '1' at time 5 ns, make a table showing the values of A, B, C and D as a

function of time until time = 20 ns. Include deltas. Indicate the times at which each process begins executing.

```
P1: process(A)
  begin
     B <= A after 5 ns;
     C <= B after 3 ns;
  end process P1;
 P2: process
  begin
        wait on B;
        A <= not B;
        D <= not A xor B;
  end process P2;
```

c) Write VHDL code for a Moore FSM to detect the sequence 101 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

SECTION – II

4. Solve **any four**. **(4×4=16)**

a) Explain the architecture of macrocell in Xilinx 9500 series CPLD.

b) Explain the difference between functional simulation and timing simulation.

c) Derive a CMOS complex gate for following logic functions

$f = \overline{x_1} + \overline{x_2}\ \overline{x_3}$.

d) Explain place and route process of EDA tools.

e) What is transmission gate ? Write its advantages.

5. Solve **any two**. **(6×2=12)**

a) Draw and explain Xilinx Spartan 4000 FPGA architecture.

b) Explain in detail boundary scan test.

c) Draw and explain the different regions of operation of CMOS Inverter.

SLR-VB – 148(a)

Seat No.	

Set P

T.E. (Electronics Engineering) (Part – II) (New-CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Self Learning)

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**.*
*3) Multiple choice question is to be **solved** first.*
*4) Figures to the **right** indicate **full** marks.*
*5) Assume suitable data **if necessary**.*

MCQ/Objective Type Questions

Marks : 10

1. Choose the correct answer : **(10×1=10)**

1) The battery is an electrochemical device, which means battery
   a) Makes chemicals by mechanical means
   b) Uses chemical action to provide electricity
   c) Has curved plates instead of flat plates
   d) Does not use an electrolyte

2) An overinflated tyre will wear the tread most near the
   a) Edges b) Corners c) Centre d) None of these

3) The negative plates of a lead acid battery has
   a) Lead peroxide (PbO_2) b) Spongy lead (Pb)
   c) Lead sulphate ($PbSO_4$) d) Sulphuric acid (H_2SO_4)

4) The auto ignition in a spark ignition engine means
   a) Automatic ignition of the charge at the end of compression
   b) Ignition induced by the passage of a spark
   c) Ignition of the charge before the passage of flame front
   d) Ignition induced to supplement the process of normal combustion

P.T.O.

5) The acid used in automobile battery is
   a) Hydrochloric acid
   b) Hydrofluoric acid
   c) Nitric acid
   d) Sulphuric acid

6) Odometer is an instrument used for measurement of
   a) Power
   b) Fuel consumption
   c) Engine r.p.m.
   d) Distance

7) The condition that results in large quantities of CO emission is
   a) Insufficient air during combustion
   b) Insufficient fuel during combustion
   c) Low temperature combustion
   d) High temperature combustion

8) A maintenance free battery
   a) Has lead-antimony plate grid
   b) Has lead-calcium plate grid
   c) Does not contain acid
   d) Does not contain water

9) An Ohm meter can be used to measure
   a) plug lead resistance
   b) switch supply voltage
   c) switch output current
   d) all of the above

10) The ignition component that steps up voltage is the
   a) spark plug
   b) condenser
   c) coil
   d) king lead

SLR-VB – 148(a)

Seat No.	

T.E. (Electronics Engineering) (Part – II) (New-CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Self Learning)

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

***Instructions** : 1) Figures to the **right** indicate **full** marks.*
*2) Assume suitable data **if necessary**.*

SECTION – I

2. Attempt **any three**. **(4×3=12)**
   1) Explain working principles, characteristics, limitations of temperature sensing system related to automobile.
   2) List various sensors used sensors used in vehicles. Explain velocity sensing mechanism.
   3) Describe topology and operation of torque sensing system in vehicle.
   4) What is noise reduction mechanism in automobile ? Explain its functioning.

3. Attempt **any one**. **(8×1=8)**
   1) Explain in detail recent battery technology and battery charging system used in vehicle.
   2) Discuss pressure and vibration sensing system in automobile in detail.

SECTION – II

4. Attempt **any three**. **(4×3=12)**
   1) What is actuator ? Explain hydraulic actuators used in automobiles.
   2) Draw basic drive circuits for pneumatic actuator and explain it in brief.
   3) Discuss in brief digital control systems used in automobiles.
   4) Discuss in brief on-board and off-board diagnosis system automotive.

5. Attempt **any one**. **(8×1=8)**
   1) What are the requirements of passenger comfort and safety ? Discuss the system providing safety of passenger in automobile in detail.
   2) What are the types of buses used in automobile ? Describe any one in detail.

Set P

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Set P

SLR-VB – 148(a)

Seat No.	

Set Q

T.E. (Electronics Engineering) (Part – II) (New-CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Self Learning)

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**.*
*3) Multiple choice question is to be **solved** first.*
*4) Figures to the **right** indicate **full** marks.*
*5) Assume suitable data **if necessary**.*

MCQ/Objective Type Questions

Marks : 10

1. Choose the correct answer : **(10×1=10)**

1) An Ohm meter can be used to measure
   a) plug lead resistance b) switch supply voltage
   c) switch output current d) all of the above

2) The ignition component that steps up voltage is the
   a) spark plug b) condenser c) coil d) king lead

3) The condition that results in large quantities of CO emission is
   a) Insufficient air during combustion
   b) Insufficient fuel during combustion
   c) Low temperature combustion
   d) High temperature combustion

4) A maintenance free battery
   a) Has lead-antimony plate grid
   b) Has lead-calcium plate grid
   c) Does not contain acid
   d) Does not contain water

P.T.O.

5) The battery is an electrochemical device, which means battery
   a) Makes chemicals by mechanical means
   b) Uses chemical action to provide electricity
   c) Has curved plates instead of flat plates
   d) Does not use an electrolyte

6) An overinflated tyre will wear the tread most near the
   a) Edges b) Corners c) Centre d) None of these

7) The acid used in automobile battery is
   a) Hydrochloric acid b) Hydrofluoric acid
   c) Nitric acid d) Sulphuric acid

8) Odometer is an instrument used for measurement of
   a) Power b) Fuel consumption
   c) Engine r.p.m. d) Distance

9) The negative plates of a lead acid battery has
   a) Lead peroxide (PbO_2) b) Spongy lead (Pb)
   c) Lead sulphate ($PbSO_4$) d) Sulphuric acid (H_2SO_4)

10) The auto ignition in a spark ignition engine means
   a) Automatic ignition of the charge at the end of compression
   b) Ignition induced by the passage of a spark
   c) Ignition of the charge before the passage of flame front
   d) Ignition induced to supplement the process of normal combustion

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SLR-VB – 148(a)

Seat No.	

T.E. (Electronics Engineering) (Part – II) (New-CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Self Learning)

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

***Instructions** : 1) Figures to the **right** indicate **full** marks.*
*2) Assume suitable data **if necessary**.*

SECTION – I

2. Attempt **any three**. **(4×3=12)**
   1) Explain working principles, characteristics, limitations of temperature sensing system related to automobile.
   2) List various sensors used sensors used in vehicles. Explain velocity sensing mechanism.
   3) Describe topology and operation of torque sensing system in vehicle.
   4) What is noise reduction mechanism in automobile ? Explain its functioning.

3. Attempt **any one**. **(8×1=8)**
   1) Explain in detail recent battery technology and battery charging system used in vehicle.
   2) Discuss pressure and vibration sensing system in automobile in detail.

SECTION – II

4. Attempt **any three**. **(4×3=12)**
   1) What is actuator ? Explain hydraulic actuators used in automobiles.
   2) Draw basic drive circuits for pneumatic actuator and explain it in brief.
   3) Discuss in brief digital control systems used in automobiles.
   4) Discuss in brief on-board and off-board diagnosis system automotive.

5. Attempt **any one**. **(8×1=8)**
   1) What are the requirements of passenger comfort and safety ? Discuss the system providing safety of passenger in automobile in detail.
   2) What are the types of buses used in automobile ? Describe any one in detail.

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Set Q

Set Q

SLR-VB – 148(a)

Seat No.	

Set R

T.E. (Electronics Engineering) (Part – II) (New-CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Self Learning)

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**.*
*3) Multiple choice question is to be **solved** first.*
*4) Figures to the **right** indicate **full** marks.*
*5) Assume suitable data **if necessary**.*

MCQ/Objective Type Questions

Marks : 10

1. Choose the correct answer : **(10×1=10)**

1) The condition that results in large quantities of CO emission is
   a) Insufficient air during combustion
   b) Insufficient fuel during combustion
   c) Low temperature combustion
   d) High temperature combustion

2) A maintenance free battery
   a) Has lead-antimony plate grid
   b) Has lead-calcium plate grid
   c) Does not contain acid
   d) Does not contain water

3) The acid used in automobile battery is
   a) Hydrochloric acid
   b) Hydrofluoric acid
   c) Nitric acid
   d) Sulphuric acid

P.T.O.

4) Odometer is an instrument used for measurement of
   a) Power
   b) Fuel consumption
   c) Engine r.p.m.
   d) Distance

5) An Ohm meter can be used to measure
   a) plug lead resistance
   b) switch supply voltage
   c) switch output current
   d) all of the above

6) The ignition component that steps up voltage is the
   a) spark plug b) condenser c) coil d) king lead

7) The negative plates of a lead acid battery has
   a) Lead peroxide (PbO_2)
   b) Spongy lead (Pb)
   c) Lead sulphate ($PbSO_4$)
   d) Sulphuric acid (H_2SO_4)

8) The auto ignition in a spark ignition engine means
   a) Automatic ignition of the charge at the end of compression
   b) Ignition induced by the passage of a spark
   c) Ignition of the charge before the passage of flame front
   d) Ignition induced to supplement the process of normal combustion

9) The battery is an electrochemical device, which means battery
   a) Makes chemicals by mechanical means
   b) Uses chemical action to provide electricity
   c) Has curved plates instead of flat plates
   d) Does not use an electrolyte

10) An overinflated tyre will wear the tread most near the
   a) Edges b) Corners c) Centre d) None of these

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SLR-VB – 148(a)

Seat No.	

T.E. (Electronics Engineering) (Part – II) (New-CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Self Learning)

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

***Instructions** : 1) Figures to the **right** indicate **full** marks.*
*2) Assume suitable data **if necessary**.*

SECTION – I

2. Attempt **any three**. **(4×3=12)**
   1) Explain working principles, characteristics, limitations of temperature sensing system related to automobile.
   2) List various sensors used sensors used in vehicles. Explain velocity sensing mechanism.
   3) Describe topology and operation of torque sensing system in vehicle.
   4) What is noise reduction mechanism in automobile ? Explain its functioning.

3. Attempt **any one**. **(8×1=8)**
   1) Explain in detail recent battery technology and battery charging system used in vehicle.
   2) Discuss pressure and vibration sensing system in automobile in detail.

SECTION – II

4. Attempt **any three**. **(4×3=12)**
   1) What is actuator ? Explain hydraulic actuators used in automobiles.
   2) Draw basic drive circuits for pneumatic actuator and explain it in brief.
   3) Discuss in brief digital control systems used in automobiles.
   4) Discuss in brief on-board and off-board diagnosis system automotive.

5. Attempt **any one**. **(8×1=8)**
   1) What are the requirements of passenger comfort and safety ? Discuss the system providing safety of passenger in automobile in detail.
   2) What are the types of buses used in automobile ? Describe any one in detail.

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Set R

Set R

SLR-VB – 148(a)

Seat No.	

Set S

T.E. (Electronics Engineering) (Part – II) (New-CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Self Learning)

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**.*
*3) Multiple choice question is to be **solved** first.*
*4) Figures to the **right** indicate **full** marks.*
*5) Assume suitable data **if necessary**.*

MCQ/Objective Type Questions

Marks : 10

1. Choose the correct answer : **(10×1=10)**

1) The negative plates of a lead acid battery has
   a) Lead peroxide (PbO_2) b) Spongy lead (Pb)
   c) Lead sulphate ($PbSO_4$) d) Sulphuric acid (H_2SO_4)

2) The auto ignition in a spark ignition engine means
   a) Automatic ignition of the charge at the end of compression
   b) Ignition induced by the passage of a spark
   c) Ignition of the charge before the passage of flame front
   d) Ignition induced to supplement the process of normal combustion

3) The battery is an electrochemical device, which means battery
   a) Makes chemicals by mechanical means
   b) Uses chemical action to provide electricity
   c) Has curved plates instead of flat plates
   d) Does not use an electrolyte

4) An overinflated tyre will wear the tread most near the
   a) Edges b) Corners c) Centre d) None of these

P.T.O.

5) The ignition component that steps up voltage is the
   a) spark plug b) condenser c) coil d) king lead

6) An Ohm meter can be used to measure
   a) plug lead resistance b) switch supply voltage
   c) switch output current d) all of the above

7) The condition that results in large quantities of CO emission is
   a) Insufficient air during combustion
   b) Insufficient fuel during combustion
   c) Low temperature combustion
   d) High temperature combustion

8) A maintenance free battery
   a) Has lead-antimony plate grid
   b) Has lead-calcium plate grid
   c) Does not contain acid
   d) Does not contain water

9) The acid used in automobile battery is
   a) Hydrochloric acid b) Hydrofluoric acid
   c) Nitric acid d) Sulphuric acid

10) Odometer is an instrument used for measurement of
   a) Power b) Fuel consumption
   c) Engine r.p.m. d) Distance

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SLR-VB – 148(a)

Seat No.	

T.E. (Electronics Engineering) (Part – II) (New-CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Self Learning)

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

***Instructions** : 1) Figures to the **right** indicate **full** marks.*
*2) Assume suitable data **if necessary**.*

SECTION – I

2. Attempt **any three**. **(4×3=12)**
   1) Explain working principles, characteristics, limitations of temperature sensing system related to automobile.
   2) List various sensors used sensors used in vehicles. Explain velocity sensing mechanism.
   3) Describe topology and operation of torque sensing system in vehicle.
   4) What is noise reduction mechanism in automobile ? Explain its functioning.

3. Attempt **any one**. **(8×1=8)**
   1) Explain in detail recent battery technology and battery charging system used in vehicle.
   2) Discuss pressure and vibration sensing system in automobile in detail.

SECTION – II

4. Attempt **any three**. **(4×3=12)**
   1) What is actuator ? Explain hydraulic actuators used in automobiles.
   2) Draw basic drive circuits for pneumatic actuator and explain it in brief.
   3) Discuss in brief digital control systems used in automobiles.
   4) Discuss in brief on-board and off-board diagnosis system automotive.

5. Attempt **any one**. **(8×1=8)**
   1) What are the requirements of passenger comfort and safety ? Discuss the system providing safety of passenger in automobile in detail.
   2) What are the types of buses used in automobile ? Describe any one in detail.

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Set S

Set S

SLR-VB – 148 (b)

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
(New – CGPA)
ROBOTICS (Self learning)

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

SECTION – I

1. Solve **any four** : **20**
   a) What are different classifications of Robot ?
   b) Explain with neat sketch "Servo Controlled Robot".
   c) List the problems encountered for Robot in arc welding.
   d) What is the function of sensor ? Give its classification.
   e) Explain how Robot is used in Spray painting ?

SECTION – II

2. Solve **any three** : **30**
   a) Explain interfacing of camera with Robotic system.
   b) What is segmentation ? Explain these holding techniques in brief.
   c) Compare stationary Robot with mobile Robot based on application, construction, speed and capacity.
   d) Explain in short principle of power and signal transmission to the end effectors.

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SLR-VB – 148(C)

Seat No.	

Set **P**

T.E. (Electronics Engineering) (Part – II) Examination, 2017
ELECTRONIC INSTRUMENTATION (New CGPA)
Self Learning

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.***
*3) **All** questions are **compulsory.***
*4) Figures to the **right** indicate **full** marks.*
*5) Assume suitable data **if** necessary.*

MCQ/Objective Type Questions

Marks : 10

1. Choose the correct answer : **(10×1=10)**

1) The errors due to human mistakes in reading are called _____ errors.
a) systematic b) instrumental c) environmental d) none of these

2) Which of below is a mode of an electronic counter ?
a) totalizing b) pH c) voltage d) current

3) LCD are _____ displays.
a) passive b) light scattering
c) reflective d) all of these

4) For DC and low frequency signal conversion _____ type ADC is used in a typical DAS.
a) single slope b) dual slope c) flash d) integration

5) A _____ is used to automatically record reading of instruments located at the different parts of the plant.
a) ADC b) DAS
c) Data logger d) Instrumentation amplifier

6) _____ is needed for passive transducers.
   a) conversion b) excitation c) pick up d) none of these

7) An ultrasonic sensor uses _____ effect.
   a) piezoelectric b) reverse piezoelectric
   c) electromagnetic d) all of these

8) Smart sensor has _____ integrated along with a sensor.
   a) voltage source b) signal processing
   c) null adjustment d) offset adjustment

9) Instrument used to measure each harmonic component separately is
   a) wave analyzer b) harmonic counter
   c) logic analyzer d) spectrum analyzer

10) Deep memory is a feature of
   a) tachometer b) pH meter c) logic analyzer d) DAS

_____

SLR-VB – 148(C)

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
ELECTRONIC INSTRUMENTATION (New CGPA)
Self Learning

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

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

SECTION – I

2. Solve **any one** : **(1×8=8)**
   a) Explain static characteristics of instrument.
   b) Draw and discuss AC signal conditioning.

3. Solve **any three** : **(3×4=12)**
   a) With suitable diagram explain pH meter.
   b) With suitable diagram explain LCD display.
   c) Explain any two types of systematic errors.
   d) With suitable diagram explain digital tachometer.

SECTION – II

4. Solve **any one** : **(1×8=8)**
   a) With suitable diagram explain wave analyzer.
   b) Draw and explain equivalent circuit of ultrasonic transmitter.

5. Solve **any three** : **(3×4=12)**
   a) What are objectives of DAS ?
   b) With suitable diagram explain data logger.
   c) What is smart sensor ? What are its applications ?
   d) Discuss applications and limitations of spectrum analyzer.

Set P

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Set P

SLR-VB – 148(C)

Seat No.	

Set **Q**

T.E. (Electronics Engineering) (Part – II) Examination, 2017
ELECTRONIC INSTRUMENTATION (New CGPA)
Self Learning

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.***
3) ***All*** *questions are* ***compulsory.***
4) Figures to the ***right*** *indicate* ***full*** *marks.*
5) Assume suitable data ***if*** *necessary.*

MCQ/Objective Type Questions

Marks : 10

1. Choose the correct answer : **(10×1=10)**

1) Instrument used to measure each harmonic component separately is
   a) wave analyzer b) harmonic counter
   c) logic analyzer d) spectrum analyzer

2) Deep memory is a feature of
   a) tachometer b) pH meter c) logic analyzer d) DAS

3) An ultrasonic sensor uses _____ effect.
   a) piezoelectric b) reverse piezoelectric
   c) electromagnetic d) all of these

4) Smart sensor has _____ integrated along with a sensor.
   a) voltage source b) signal processing
   c) null adjustment d) offset adjustment

5) The errors due to human mistakes in reading are called _____ errors.
   a) systematic b) instrumental c) environmental d) none of these

6) Which of below is a mode of an electronic counter ?

a) totalizing b) pH c) voltage d) current

7) LCD are _____ displays.

a) passive b) light scattering

c) reflective d) all of these

8) For DC and low frequency signal conversion _____ type ADC is used in a typical DAS.

a) single slope b) dual slope c) flash d) integration

9) A _____ is used to automatically record reading of instruments located at the different parts of the plant.

a) ADC b) DAS

c) Data logger d) Instrumentation amplifier

10) _____ is needed for passive transducers.

a) conversion b) excitation c) pick up d) none of these

_____

SLR-VB – 148(C)

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
ELECTRONIC INSTRUMENTATION (New CGPA)
Self Learning

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

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

SECTION – I

2. Solve **any one** : **(1×8=8)**
   a) Explain static characteristics of instrument.
   b) Draw and discuss AC signal conditioning.

3. Solve **any three** : **(3×4=12)**
   a) With suitable diagram explain pH meter.
   b) With suitable diagram explain LCD display.
   c) Explain any two types of systematic errors.
   d) With suitable diagram explain digital tachometer.

SECTION – II

4. Solve **any one** : **(1×8=8)**
   a) With suitable diagram explain wave analyzer.
   b) Draw and explain equivalent circuit of ultrasonic transmitter.

5. Solve **any three** : **(3×4=12)**
   a) What are objectives of DAS ?
   b) With suitable diagram explain data logger.
   c) What is smart sensor ? What are its applications ?
   d) Discuss applications and limitations of spectrum analyzer.

Set Q

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Set Q

SLR-VB – 148(C)

Seat No.	

Set **R**

T.E. (Electronics Engineering) (Part – II) Examination, 2017
ELECTRONIC INSTRUMENTATION (New CGPA)
Self Learning

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.***
*3) **All** questions are **compulsory.***
*4) Figures to the **right** indicate **full** marks.*
*5) Assume suitable data **if** necessary.*

MCQ/Objective Type Questions

Marks : 10

1. Choose the correct answer : **(10×1=10)**

1) A _____ is used to automatically record reading of instruments located at the different parts of the plant.
   a) ADC b) DAS
   c) Data logger d) Instrumentation amplifier

2) _____ is needed for passive transducers.
   a) conversion b) excitation c) pick up d) none of these

3) Instrument used to measure each harmonic component separately is
   a) wave analyzer b) harmonic counter
   c) logic analyzer d) spectrum analyzer

4) Deep memory is a feature of
   a) tachometer b) pH meter c) logic analyzer d) DAS

5) LCD are _____ displays.
   a) passive b) light scattering
   c) reflective d) all of these

P.T.O.

6) For DC and low frequency signal conversion _____ type ADC is used in a typical DAS.
   a) single slope b) dual slope c) flash d) integration

7) The errors due to human mistakes in reading are called _____ errors.
   a) systematic b) instrumental c) environmental d) none of these

8) Which of below is a mode of an electronic counter ?
   a) totalizing b) pH c) voltage d) current

9) An ultrasonic sensor uses _____ effect.
   a) piezoelectric b) reverse piezoelectric
   c) electromagnetic d) all of these

10) Smart sensor has _____ integrated along with a sensor.
   a) voltage source b) signal processing
   c) null adjustment d) offset adjustment

_____

SLR-VB – 148(C)

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
ELECTRONIC INSTRUMENTATION (New CGPA)
Self Learning

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

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

SECTION – I

2. Solve **any one** : **(1×8=8)**
   a) Explain static characteristics of instrument.
   b) Draw and discuss AC signal conditioning.

3. Solve **any three** : **(3×4=12)**
   a) With suitable diagram explain pH meter.
   b) With suitable diagram explain LCD display.
   c) Explain any two types of systematic errors.
   d) With suitable diagram explain digital tachometer.

SECTION – II

4. Solve **any one** : **(1×8=8)**
   a) With suitable diagram explain wave analyzer.
   b) Draw and explain equivalent circuit of ultrasonic transmitter.

5. Solve **any three** : **(3×4=12)**
   a) What are objectives of DAS ?
   b) With suitable diagram explain data logger.
   c) What is smart sensor ? What are its applications ?
   d) Discuss applications and limitations of spectrum analyzer.

Set R

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Set R

SLR-VB – 148(C)

Seat No.	

Set S

T.E. (Electronics Engineering) (Part – II) Examination, 2017
ELECTRONIC INSTRUMENTATION (New CGPA)
Self Learning

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.***
*3) **All** questions are **compulsory.***
*4) Figures to the **right** indicate **full** marks.*
*5) Assume suitable data **if** necessary.*

MCQ/Objective Type Questions

Marks : 10

1. Choose the correct answer : **(10×1=10)**

1) LCD are _____ displays.
   a) passive b) light scattering
   c) reflective d) all of these

2) For DC and low frequency signal conversion _____ type ADC is used in a typical DAS.
   a) single slope b) dual slope c) flash d) integration

3) A _____ is used to automatically record reading of instruments located at the different parts of the plant.
   a) ADC b) DAS
   c) Data logger d) Instrumentation amplifier

4) _____ is needed for passive transducers.
   a) conversion b) excitation c) pick up d) none of these

5) An ultrasonic sensor uses _____ effect.
   a) piezoelectric b) reverse piezoelectric
   c) electromagnetic d) all of these

P.T.O.

6) Smart sensor has _____ integrated along with a sensor.
   a) voltage source b) signal processing
   c) null adjustment d) offset adjustment

7) Instrument used to measure each harmonic component separately is
   a) wave analyzer b) harmonic counter
   c) logic analyzer d) spectrum analyzer

8) Deep memory is a feature of
   a) tachometer b) pH meter c) logic analyzer d) DAS

9) The errors due to human mistakes in reading are called _____ errors.
   a) systematic b) instrumental c) environmental d) none of these

10) Which of below is a mode of an electronic counter ?
   a) totalizing b) pH c) voltage d) current

_____

SLR-VB – 148(C)

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
ELECTRONIC INSTRUMENTATION (New CGPA)
Self Learning

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

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

SECTION – I

2. Solve **any one** : **(1×8=8)**
   a) Explain static characteristics of instrument.
   b) Draw and discuss AC signal conditioning.

3. Solve **any three** : **(3×4=12)**
   a) With suitable diagram explain pH meter.
   b) With suitable diagram explain LCD display.
   c) Explain any two types of systematic errors.
   d) With suitable diagram explain digital tachometer.

SECTION – II

4. Solve **any one** : **(1×8=8)**
   a) With suitable diagram explain wave analyzer.
   b) Draw and explain equivalent circuit of ultrasonic transmitter.

5. Solve **any three** : **(3×4=12)**
   a) What are objectives of DAS ?
   b) With suitable diagram explain data logger.
   c) What is smart sensor ? What are its applications ?
   d) Discuss applications and limitations of spectrum analyzer.

Set S

_____

Set S

SLR-VB – 148 (d)

Seat No.	

Set **P**

T.E. (Electronics) Part – II (New-CGPA) Examination, 2017
Self Learning
PROGRAMMING IN VISUAL BASIC .NET

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

Instructions *: 1) Attempt* ***all*** *the questions.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) Q. No. ***1*** *is* ***compulsory****. It should be solved 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

Marks : 10

1. Choose the correct answer : **(10×1=10)**

1) Using a _____ variable does not enable us to create read-only properties that are often required by a class.
A) Public B) Private C) Protected D) Friend

2) A _____ performs invisible tasks even if you write no code.
A) destructor B) private method
C) constructor D) function

3) The _____ does not describe inherited member functions, inherited operators and overridden virtual member functions.
A) Class Library Reference B) Library
C) Objects D) Classes

4) The _____ group classes according to their common services.
A) Objects B) Inheritance
C) Namespaces D) Programs

5) Whenever an application is created, a _____ is added.
A) Form B) Class C) Property D) Object

6) _____ are interactive objects that you place in dialog boxes or other windows to carry out user actions.
A) Controls B) Objects C) Classes D) Forms

7) The _____ class provides static methods to start, stop or filter windows messages in an application.
   A) Forms B) Windows C) Application D) Control

8) The _____ is a systematic class framework used for the development of system tools and utilities.
   A) .Net Framework Class Library (FCL)
   B) .Net tools
   C) Visual Basic 2005
   D) Visual Basic 6

9) The _____ method converts the value of this instance to a double representing the OLE automation date.
   A) From OA Date B) To OA Date
   C) Today D) Now

10) The _____ enable us to pass data between a program and a class.
   A) Functions B) Properties C) Procedures D) Variables

_____

SLR-VB – 148 (d)

Seat No.	

T.E. (Electronics) Part – II (New-CGPA) Examination, 2017
Self Learning
PROGRAMMING IN VISUAL BASIC .NET

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

Instructions *: 1) Attempt* ***all*** *the questions.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

2. What is the enumeration ? How do you create it ? Give example. **10**

3. Explain features of vb.net. **10**

OR

Define exception. Explain different types of exception.

4. Attempt **any four** questions : **20**
   a) Differentiate between Select Case and ELSE IF.
   b) Explain string function with example.
   c) Explain .net framework.
   d) Write a note on user defined functions.
   e) How to declare a constant ?

Set P

SLR-VB – 148 (d)

Seat No.	

Set **Q**

T.E. (Electronics) Part – II (New-CGPA) Examination, 2017
Self Learning
PROGRAMMING IN VISUAL BASIC .NET

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

Instructions *: 1) Attempt* ***all*** *the questions.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) Q. No. ***1*** *is* ***compulsory****. It should be solved 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

Marks : 10

1. Choose the correct answer : **(10×1=10)**

1) The _____ method converts the value of this instance to a double representing the OLE automation date.
A) From OA Date B) To OA Date
C) Today D) Now

2) The _____ enable us to pass data between a program and a class.
A) Functions B) Properties C) Procedures D) Variables

3) The _____ class provides static methods to start, stop or filter windows messages in an application.
A) Forms B) Windows C) Application D) Control

4) The _____ is a systematic class framework used for the development of system tools and utilities.
A) .Net Framework Class Library (FCL)
B) .Net tools
C) Visual Basic 2005
D) Visual Basic 6

5) Using a _____ variable does not enable us to create read-only properties that are often required by a class.
A) Public B) Private C) Protected D) Friend

6) A _____ performs invisible tasks even if you write no code.
   A) destructor B) private method
   C) constructor D) function

7) The _____ does not describe inherited member functions, inherited operators and overridden virtual member functions.
   A) Class Library Reference B) Library
   C) Objects D) Classes

8) The _____ group classes according to their common services.
   A) Objects B) Inheritance
   C) Namespaces D) Programs

9) Whenever an application is created, a _____ is added.
   A) Form B) Class C) Property D) Object

10) _____ are interactive objects that you place in dialog boxes or other windows to carry out user actions.
   A) Controls B) Objects C) Classes D) Forms

_____

SLR-VB – 148 (d)

Seat No.	

T.E. (Electronics) Part – II (New-CGPA) Examination, 2017
Self Learning
PROGRAMMING IN VISUAL BASIC .NET

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

Instructions *: 1) Attempt* ***all*** *the questions.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

2. What is the enumeration ? How do you create it ? Give example. **10**

3. Explain features of vb.net. **10**

OR

Define exception. Explain different types of exception.

4. Attempt **any four** questions : **20**
   a) Differentiate between Select Case and ELSE IF.
   b) Explain string function with example.
   c) Explain .net framework.
   d) Write a note on user defined functions.
   e) How to declare a constant ?

Set Q

SLR-VB – 148 (d)

Seat No.	

Set **R**

T.E. (Electronics) Part – II (New-CGPA) Examination, 2017
Self Learning
PROGRAMMING IN VISUAL BASIC .NET

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

Instructions *: 1) Attempt* ***all*** *the questions.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) Q. No. ***1*** *is* ***compulsory****. It should be solved 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

Marks : 10

1. Choose the correct answer : **(10×1=10)**

1) Whenever an application is created, a _____ is added.
A) Form B) Class C) Property D) Object

2) _____ are interactive objects that you place in dialog boxes or other windows to carry out user actions.
A) Controls B) Objects C) Classes D) Forms

3) The _____ method converts the value of this instance to a double representing the OLE automation date.
A) From OA Date B) To OA Date
C) Today D) Now

4) The _____ enable us to pass data between a program and a class.
A) Functions B) Properties C) Procedures D) Variables

5) The _____ does not describe inherited member functions, inherited operators and overridden virtual member functions.
A) Class Library Reference B) Library
C) Objects D) Classes

6) The _____ group classes according to their common services.
A) Objects B) Inheritance
C) Namespaces D) Programs

7) Using a _____ variable does not enable us to create read-only properties that are often required by a class.
   A) Public B) Private C) Protected D) Friend

8) A _____ performs invisible tasks even if you write no code.
   A) destructor B) private method
   C) constructor D) function

9) The _____ class provides static methods to start, stop or filter windows messages in an application.
   A) Forms B) Windows C) Application D) Control

10) The _____ is a systematic class framework used for the development of system tools and utilities.
   A) .Net Framework Class Library (FCL)
   B) .Net tools
   C) Visual Basic 2005
   D) Visual Basic 6

_____

SLR-VB – 148 (d)

Seat No.	

T.E. (Electronics) Part – II (New-CGPA) Examination, 2017
Self Learning
PROGRAMMING IN VISUAL BASIC .NET

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

Instructions *: 1) Attempt* ***all*** *the questions.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

2. What is the enumeration ? How do you create it ? Give example. **10**

3. Explain features of vb.net. **10**

OR

Define exception. Explain different types of exception.

4. Attempt **any four** questions : **20**
   a) Differentiate between Select Case and ELSE IF.
   b) Explain string function with example.
   c) Explain .net framework.
   d) Write a note on user defined functions.
   e) How to declare a constant ?

Set R

SLR-VB – 148 (d)

Seat No.	

Set **S**

T.E. (Electronics) Part – II (New-CGPA) Examination, 2017
Self Learning
PROGRAMMING IN VISUAL BASIC .NET

Day and Date : Friday, 26-5-2017 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

Instructions *: 1) Attempt* ***all*** *the questions.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) Q. No. ***1*** *is* ***compulsory****. It should be solved 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

Marks : 10

1. Choose the correct answer : **(10×1=10)**

1) The _____ does not describe inherited member functions, inherited operators and overridden virtual member functions.
A) Class Library Reference B) Library
C) Objects D) Classes

2) The _____ group classes according to their common services.
A) Objects B) Inheritance
C) Namespaces D) Programs

3) Whenever an application is created, a _____ is added.
A) Form B) Class
C) Property D) Object

4) _____ are interactive objects that you place in dialog boxes or other windows to carry out user actions.
A) Controls B) Objects
C) Classes D) Forms

5) The _____ class provides static methods to start, stop or filter windows messages in an application.
A) Forms B) Windows
C) Application D) Control

6) The _____ is a systematic class framework used for the development of system tools and utilities.
   A) .Net Framework Class Library (FCL)
   B) .Net tools
   C) Visual Basic 2005
   D) Visual Basic 6

7) The _____ method converts the value of this instance to a double representing the OLE automation date.
   A) From OA Date B) To OA Date
   C) Today D) Now

8) The _____ enable us to pass data between a program and a class.
   A) Functions B) Properties C) Procedures D) Variables

9) Using a _____ variable does not enable us to create read-only properties that are often required by a class.
   A) Public B) Private C) Protected D) Friend

10) A _____ performs invisible tasks even if you write no code.
   A) destructor B) private method
   C) constructor D) function

_____

SLR-VB – 148 (d)

Seat No.	

T.E. (Electronics) Part – II (New-CGPA) Examination, 2017
Self Learning
PROGRAMMING IN VISUAL BASIC .NET

Day and Date : Friday, 26-5-2017 Marks : 40
Time : 3.00 p.m. to 5.00 p.m.

Instructions *: 1) Attempt* ***all*** *the questions.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

2. What is the enumeration ? How do you create it ? Give example. **10**

3. Explain features of vb.net. **10**

OR

Define exception. Explain different types of exception.

4. Attempt **any four** questions : **20**
   a) Differentiate between Select Case and ELSE IF.
   b) Explain string function with example.
   c) Explain .net framework.
   d) Write a note on user defined functions.
   e) How to declare a constant ?

Set S

SLR-VB – 149

Seat No.	

Set P

B.E. (Electronics) (Part – I) Examination, 2017
POWER ELECTRONICS

Day and Date : Thursday, 4-5-2017 Max. Marks : 100
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* ***maximum*** *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 : 20

1. Choose the correct answer :

1) A converter which can operate as 6-pulse converter is a
   a) 3-phase half wave b) 3-phase full-converter
   c) 3-phase semiconverter d) both b) and c)

2) Three phase half wave controlled rectifier is connected to a 3ϕ 440 V, 50 Hz AC source. Output ripple frequency will be
   a) 50 Hz b) 150 Hz c) 300 Hz d) 25 Hz

3) In three phase full converter PIV across any thyristor is
   a) $\sqrt{2}V_{LL}$ b) $\sqrt{3}V_m$ c) $\sqrt{3}V_{LL}$ d) Both a) and b)

4) Four quadrant converters are
   a) Dual converter b) Class E chopper
   c) Both a) and b) d) Single phase controlled converter

5) In _____ chopper load current is always positive and load voltage is positive or negative.
   a) Class D b) Class A c) Class B d) Both a) and b)

6) In thyristor dc chopper _____ type of commutation results in best performance.
   a) Natural commutation b) Current commutation
   c) Load commutation d) Voltage commutation

7) In _____inverter output frequency is independent of commutating component but depends upon triggering frequency of thyristors.
   a) Parallel b) Series
   c) Improved Series Inverter d) Both b) and c)

P.T.O.

8) For step down chopper V_s is source voltage, R_L is load resistance and K is duty cycle average output voltage of this chopper is
   a) $K \times V_s$ b) $(1 - K)/V_s$ c) V_s/K d) $V_s/(1 - K)$
9) A three phase to three phase cycloconverter using 6-pulse converter uses
   a) 6 SCR's b) 12 SCR's c) 36 SCR's d) 18 SCR's
10) A cycloconverters is a
   a) Frequency converter b) AC voltage converter
   c) Amplitude converter d) None of the above
11) Using Sinusoidal PWM control method
   a) Lower order harmonics can be minimized
   b) Distortion factor reduces
   c) Both a) and b)
   d) Input voltage is controlled
12) In three phase 180° conduction mode
   a) All even harmonics are present b) Triplen harmonics are absent
   c) No possibility of short circuit d) All the above
13) Power factor can be corrected by
   a) Overexcited synchronous motor b) Capacitive power factor corrector
   c) Static VAR compensator d) All the above
14) Speed control of DC motor can be obtained from
   a) Step down chopper b) Four quadrant chopper
   c) Jones chopper d) All the above
15) Application of cycloconverter
   a) Speed control of AC drive b) Speed control of DC drive
   c) Speed control of BLDC drive d) High speed AC drive
16) In _____ technique number of harmonics are eliminated at a time.
   a) Sinusoidal pulse width modulation
   b) Multiple pulse modulation
   c) Single pulse modulation
   d) Series inverter using transformer connection
17) In three phase bridge inverter 180° and 120° conduction mode number of power devices that can conduct simultaneously.
   a) 2, 3 b) 3, 3 c) 3, 2 d) 2, 2
18) In multiple pulse width modulation technique RMS value of output voltage is
   a) $V_s\sqrt{\frac{p\delta}{\pi}}$ b) $V_s\sqrt{\frac{\delta}{p\pi}}$ c) $V_s\sqrt{\frac{\pi\delta}{p}}$ d) $V_s\sqrt{\frac{p}{\delta\pi}}$
19) In single phase full bridge inverter has dc input voltage is 250 V, RMS output voltage will be
   a) 250 V b) 125 V c) 176.77 V d) 500 V
20) The concept of V/f control of inverters driving induction motors results in
   a) Constant torque operation b) Speed reversal
   c) Reduced magnetic loss d) Harmonic elimination

Set P

_____

SLR-VB – 149

Seat No.	

B.E. (Electronics) (Part – I) Examination, 2017
POWER ELECTRONICS

Day and Date : Thursday, 4-5-2017 Total Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*

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

SECTION – I

2. Attempt **any four** : **(4×6=24)**

1) A three phase semiconverter is operated from 3 phase 400 V 50 Hz mains supply and delivers power to sufficiently large inductive load having resistance of $10\,\Omega$. If it is required that average output voltage should be 50% of maximum possible voltage. Calculate
   a) Firing angle
   b) Power delivered to load
   c) Thyristors rating

2) Derive an expression for the average output voltage in terms of input dc voltage and duty cycle for step up chopper.

3) Explain working of class E chopper.

4) Derive an expression for average output voltage and RMS output voltage of three phase fully controlled rectifier.

5) A three phase controlled rectifier is supplied from $3\varnothing$ 230 V, 60 Hz supply. Load current is continuous and ripple free. If Idc = 150 A and commutating inductance L_C = 0.1 mH. Calculate overlap angle when $\alpha = 10°$ and 30°.

3. Attempt **any two** : **(2×8=16)**

1) Design DSP based firing scheme for three phase controlled converters.

2) Describe the process of commutation of main thyristor by means of suitable diagram and waveforms in Jones chopper with associated voltage and current waveforms.

3) Design single phase 5 : 1 midpoint cycloconverter with resistive load. Sketch associated waveforms. Explain firing scheme to obtain approximate sinusoidal wave.

SECTION – II

4. Attempt **any four** : **(4×6=24)**

   1) Calculate resonant frequency and output frequency of series inverter circuit with following specifications. L = 10 mH, C = 0.14 μF, $R_L = 400\,\Omega$, t_{OFF} = 0.2 msec.

   2) Explain operation of single phase full bridge IGBT based voltage source inverter with inductive load and sketch associate waveforms.

   3) The output voltage of single phase full bridge inverter is controlled by PWM with one pulse per half cycle.
      a) Determine the required pulse width so that rms load voltage is 70% of input dc voltage.
      b) If pulse width is 30° and input dc supply is 220 V calculate rms value of load voltage.

   4) Explain various schemes of speed control of dc motor.

   5) Compare 180° conduction mode and 120° conduction mode of 3φ transistorized bridge inverter.

5. Attempt **any two** : **(2×8=16)**

   1) With help of suitable block diagram and flowchart explain working of micro controller based four quadrant AC drive.

   2) Explain working of parallel inverter with highly inductive load. Sketch appropriate waveforms.

   3) Explain different methods for improvement of power factor corrector.

———————

SLR-VB – 149

Seat No.	

Set Q

B.E. (Electronics) (Part – I) Examination, 2017
POWER ELECTRONICS

Day and Date : Thursday, 4-5-2017 Max. Marks : 100
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* ***maximum*** *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 : 20

1. Choose the correct answer :

1) In _____ technique number of harmonics are eliminated at a time.
   a) Sinusoidal pulse width modulation
   b) Multiple pulse modulation
   c) Single pulse modulation
   d) Series inverter using transformer connection

2) In three phase bridge inverter 180° and 120° conduction mode number of power devices that can conduct simultaneously.
   a) 2, 3 b) 3, 3 c) 3, 2 d) 2, 2

3) In multiple pulse width modulation technique RMS value of output voltage is
   a) $V_s\sqrt{\frac{p\delta}{\pi}}$ b) $V_s\sqrt{\frac{\delta}{p\pi}}$ c) $V_s\sqrt{\frac{\pi\delta}{p}}$ d) $V_s\sqrt{\frac{p}{\delta\pi}}$

4) In single phase full bridge inverter has dc input voltage is 250 V, RMS output voltage will be
   a) 250 V b) 125 V c) 176.77 V d) 500 V

5) The concept of V/f control of inverters driving induction motors results in
   a) Constant torque operation b) Speed reversal
   c) Reduced magnetic loss d) Harmonic elimination

6) A converter which can operate as 6-pulse converter is a
   a) 3-phase half wave b) 3-phase full-converter
   c) 3-phase semiconverter d) both b) and c)

7) Three phase half wave controlled rectifier is connected to a 3ϕ 440 V, 50 Hz AC source. Output ripple frequency will be
   a) 50 Hz b) 150 Hz c) 300 Hz d) 25 Hz

P.T.O.

8) In three phase full converter PIV across any thyristor is
   a) $\sqrt{2}V_{LL}$ b) $\sqrt{3}V_m$ c) $\sqrt{3}V_{LL}$ d) Both a) and b)
9) Four quadrant converters are
   a) Dual converter b) Class E chopper
   c) Both a) and b) d) Single phase controlled converter
10) In _____ chopper load current is always positive and load voltage is positive or negative.
   a) Class D b) Class A c) Class B d) Both a) and b)
11) In thyristor dc chopper _____ type of commutation results in best performance.
   a) Natural commutation b) Current commutation
   c) Load commutation d) Voltage commutation
12) In _____inverter output frequency is independent of commutating component but depends upon triggering frequency of thyristors.
   a) Parallel b) Series
   c) Improved Series Inverter d) Both b) and c)
13) For step down chopper V_s is source voltage, R_L is load resistance and K is duty cycle average output voltage of this chopper is
   a) $K \times V_s$ b) $(1 - K)/V_s$ c) V_s/K d) $V_s/(1 - K)$
14) A three phase to three phase cycloconverter using 6-pulse converter uses
   a) 6 SCR's b) 12 SCR's c) 36 SCR's d) 18 SCR's
15) A cycloconverters is a
   a) Frequency converter b) AC voltage converter
   c) Amplitude converter d) None of the above
16) Using Sinusoidal PWM control method
   a) Lower order harmonics can be minimized
   b) Distortion factor reduces
   c) Both a) and b)
   d) Input voltage is controlled
17) In three phase 180° conduction mode
   a) All even harmonics are present b) Triplen harmonics are absent
   c) No possibility of short circuit d) All the above
18) Power factor can be corrected by
   a) Overexcited synchronous motor b) Capacitive power factor corrector
   c) Static VAR compensator d) All the above
19) Speed control of DC motor can be obtained from
   a) Step down chopper b) Four quadrant chopper
   c) Jones chopper d) All the above
20) Application of cycloconverter
   a) Speed control of AC drive b) Speed control of DC drive
   c) Speed control of BLDC drive d) High speed AC drive

_____

SLR-VB – 149

Seat No.	

B.E. (Electronics) (Part – I) Examination, 2017
POWER ELECTRONICS

Day and Date : Thursday, 4-5-2017 Total Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*

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

SECTION – I

2. Attempt **any four** : **(4×6=24)**

1) A three phase semiconverter is operated from 3 phase 400 V 50 Hz mains supply and delivers power to sufficiently large inductive load having resistance of $10\,\Omega$. If it is required that average output voltage should be 50% of maximum possible voltage. Calculate
   a) Firing angle
   b) Power delivered to load
   c) Thyristors rating

2) Derive an expression for the average output voltage in terms of input dc voltage and duty cycle for step up chopper.

3) Explain working of class E chopper.

4) Derive an expression for average output voltage and RMS output voltage of three phase fully controlled rectifier.

5) A three phase controlled rectifier is supplied from $3\varnothing$ 230 V, 60 Hz supply. Load current is continuous and ripple free. If Idc = 150 A and commutating inductance L_C = 0.1 mH. Calculate overlap angle when $\alpha = 10°$ and 30°.

3. Attempt **any two** : **(2×8=16)**

1) Design DSP based firing scheme for three phase controlled converters.

2) Describe the process of commutation of main thyristor by means of suitable diagram and waveforms in Jones chopper with associated voltage and current waveforms.

3) Design single phase 5 : 1 midpoint cycloconverter with resistive load. Sketch associated waveforms. Explain firing scheme to obtain approximate sinusoidal wave.

SECTION – II

4. Attempt **any four** : **(4×6=24)**

   1) Calculate resonant frequency and output frequency of series inverter circuit with following specifications. L = 10 mH, C = 0.14 μF, $R_L = 400\,\Omega$, t_{OFF} = 0.2 msec.

   2) Explain operation of single phase full bridge IGBT based voltage source inverter with inductive load and sketch associate waveforms.

   3) The output voltage of single phase full bridge inverter is controlled by PWM with one pulse per half cycle.
      a) Determine the required pulse width so that rms load voltage is 70% of input dc voltage.
      b) If pulse width is 30° and input dc supply is 220 V calculate rms value of load voltage.

   4) Explain various schemes of speed control of dc motor.

   5) Compare 180° conduction mode and 120° conduction mode of 3φ transistorized bridge inverter.

5. Attempt **any two** : **(2×8=16)**

   1) With help of suitable block diagram and flowchart explain working of micro controller based four quadrant AC drive.

   2) Explain working of parallel inverter with highly inductive load. Sketch appropriate waveforms.

   3) Explain different methods for improvement of power factor corrector.

———————

SLR-VB – 149

Seat No.	

Set R

B.E. (Electronics) (Part – I) Examination, 2017
POWER ELECTRONICS

Day and Date : Thursday, 4-5-2017 Max. Marks : 100
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* ***maximum*** *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 : 20

1. Choose the correct answer :

1) Using Sinusoidal PWM control method
   a) Lower order harmonics can be minimized
   b) Distortion factor reduces
   c) Both a) and b)
   d) Input voltage is controlled

2) In three phase 180° conduction mode
   a) All even harmonics are present
   b) Triplen harmonics are absent
   c) No possibility of short circuit
   d) All the above

3) Power factor can be corrected by
   a) Overexcited synchronous motor
   b) Capacitive power factor corrector
   c) Static VAR compensator
   d) All the above

4) Speed control of DC motor can be obtained from
   a) Step down chopper
   b) Four quadrant chopper
   c) Jones chopper
   d) All the above

5) Application of cycloconverter
   a) Speed control of AC drive
   b) Speed control of DC drive
   c) Speed control of BLDC drive
   d) High speed AC drive

6) In _____ technique number of harmonics are eliminated at a time.
   a) Sinusoidal pulse width modulation
   b) Multiple pulse modulation
   c) Single pulse modulation
   d) Series inverter using transformer connection

7) In three phase bridge inverter 180° and 120° conduction mode number of power devices that can conduct simultaneously.
a) 2, 3 b) 3, 3 c) 3, 2 d) 2, 2

8) In multiple pulse width modulation technique RMS value of output voltage is
a) $V_s\sqrt{\frac{p\delta}{\pi}}$ b) $V_s\sqrt{\frac{\delta}{p\pi}}$ c) $V_s\sqrt{\frac{\pi\delta}{p}}$ d) $V_s\sqrt{\frac{p}{\delta\pi}}$

9) In single phase full bridge inverter has dc input voltage is 250 V, RMS output voltage will be
a) 250 V b) 125 V c) 176.77 V d) 500 V

10) The concept of V/f control of inverters driving induction motors results in
a) Constant torque operation b) Speed reversal
c) Reduced magnetic loss d) Harmonic elimination

11) A converter which can operate as 6-pulse converter is a
a) 3-phase half wave b) 3-phase full-converter
c) 3-phase semiconverter d) both b) and c)

12) Three phase half wave controlled rectifier is connected to a 3ϕ 440 V, 50 Hz AC source. Output ripple frequency will be
a) 50 Hz b) 150 Hz c) 300 Hz d) 25 Hz

13) In three phase full converter PIV across any thyristor is
a) $\sqrt{2}V_{LL}$ b) $\sqrt{3}V_m$ c) $\sqrt{3}V_{LL}$ d) Both a) and b)

14) Four quadrant converters are
a) Dual converter b) Class E chopper
c) Both a) and b) d) Single phase controlled converter

15) In _____ chopper load current is always positive and load voltage is positive or negative.
a) Class D b) Class A c) Class B d) Both a) and b)

16) In thyristor dc chopper _____ type of commutation results in best performance.
a) Natural commutation b) Current commutation
c) Load commutation d) Voltage commutation

17) In _____inverter output frequency is independent of commutating component but depends upon triggering frequency of thyristors.
a) Parallel b) Series
c) Improved Series Inverter d) Both b) and c)

18) For step down chopper V_s is source voltage, R_L is load resistance and K is duty cycle average output voltage of this chopper is
a) $K \times V_s$ b) $(1 - K)/V_s$ c) V_s/K d) $V_s/(1 - K)$

19) A three phase to three phase cycloconverter using 6-pulse converter uses
a) 6 SCR's b) 12 SCR's c) 36 SCR's d) 18 SCR's

20) A cycloconverters is a
a) Frequency converter b) AC voltage converter
c) Amplitude converter d) None of the above

Set R

_____

SLR-VB – 149

Seat No.	

B.E. (Electronics) (Part – I) Examination, 2017
POWER ELECTRONICS

Day and Date : Thursday, 4-5-2017 Total Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*

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

SECTION – I

2. Attempt **any four** : **(4×6=24)**

1) A three phase semiconverter is operated from 3 phase 400 V 50 Hz mains supply and delivers power to sufficiently large inductive load having resistance of $10\,\Omega$. If it is required that average output voltage should be 50% of maximum possible voltage. Calculate
   a) Firing angle
   b) Power delivered to load
   c) Thyristors rating

2) Derive an expression for the average output voltage in terms of input dc voltage and duty cycle for step up chopper.

3) Explain working of class E chopper.

4) Derive an expression for average output voltage and RMS output voltage of three phase fully controlled rectifier.

5) A three phase controlled rectifier is supplied from $3\varnothing$ 230 V, 60 Hz supply. Load current is continuous and ripple free. If Idc = 150 A and commutating inductance L_C = 0.1 mH. Calculate overlap angle when $\alpha = 10°$ and 30°.

3. Attempt **any two** : **(2×8=16)**

1) Design DSP based firing scheme for three phase controlled converters.

2) Describe the process of commutation of main thyristor by means of suitable diagram and waveforms in Jones chopper with associated voltage and current waveforms.

3) Design single phase 5 : 1 midpoint cycloconverter with resistive load. Sketch associated waveforms. Explain firing scheme to obtain approximate sinusoidal wave.

SECTION – II

4. Attempt **any four** : **(4×6=24)**

   1) Calculate resonant frequency and output frequency of series inverter circuit with following specifications. L = 10 mH, C = 0.14 μF, $R_L = 400\,\Omega$, t_{OFF} = 0.2 msec.

   2) Explain operation of single phase full bridge IGBT based voltage source inverter with inductive load and sketch associate waveforms.

   3) The output voltage of single phase full bridge inverter is controlled by PWM with one pulse per half cycle.
      a) Determine the required pulse width so that rms load voltage is 70% of input dc voltage.
      b) If pulse width is 30° and input dc supply is 220 V calculate rms value of load voltage.

   4) Explain various schemes of speed control of dc motor.

   5) Compare 180° conduction mode and 120° conduction mode of 3φ transistorized bridge inverter.

5. Attempt **any two** : **(2×8=16)**

   1) With help of suitable block diagram and flowchart explain working of micro controller based four quadrant AC drive.

   2) Explain working of parallel inverter with highly inductive load. Sketch appropriate waveforms.

   3) Explain different methods for improvement of power factor corrector.

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SLR-VB – 149

Seat No.	

Set S

B.E. (Electronics) (Part – I) Examination, 2017
POWER ELECTRONICS

Day and Date : Thursday, 4-5-2017 Max. Marks : 100
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* ***maximum*** *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 : 20

1. Choose the correct answer :

1) In thyristor dc chopper _____ type of commutation results in best performance.
   a) Natural commutation b) Current commutation
   c) Load commutation d) Voltage commutation

2) In _____inverter output frequency is independent of commutating component but depends upon triggering frequency of thyristors.
   a) Parallel b) Series
   c) Improved Series Inverter d) Both b) and c)

3) For step down chopper V_s is source voltage, R_L is load resistance and K is duty cycle average output voltage of this chopper is
   a) $K \times V_s$ b) $(1 - K)/V_s$ c) V_s/K d) $V_s/(1 - K)$

4) A three phase to three phase cycloconverter using 6-pulse converter uses
   a) 6 SCR's b) 12 SCR's c) 36 SCR's d) 18 SCR's

5) A cycloconverters is a
   a) Frequency converter b) AC voltage converter
   c) Amplitude converter d) None of the above

6) Using Sinusoidal PWM control method
   a) Lower order harmonics can be minimized
   b) Distortion factor reduces
   c) Both a) and b)
   d) Input voltage is controlled

7) In three phase 180° conduction mode
   a) All even harmonics are present b) Triplen harmonics are absent
   c) No possibility of short circuit d) All the above

P.T.O.

8) Power factor can be corrected by
   a) Overexcited synchronous motor b) Capacitive power factor corrector
   c) Static VAR compensator d) All the above

9) Speed control of DC motor can be obtained from
   a) Step down chopper b) Four quadrant chopper
   c) Jones chopper d) All the above

10) Application of cycloconverter
   a) Speed control of AC drive b) Speed control of DC drive
   c) Speed control of BLDC drive d) High speed AC drive

11) In _____ technique number of harmonics are eliminated at a time.
   a) Sinusoidal pulse width modulation
   b) Multiple pulse modulation
   c) Single pulse modulation
   d) Series inverter using transformer connection

12) In three phase bridge inverter 180° and 120° conduction mode number of power devices that can conduct simultaneously.
   a) 2, 3 b) 3, 3 c) 3, 2 d) 2, 2

13) In multiple pulse width modulation technique RMS value of output voltage is
   a) $V_s\sqrt{\frac{p\delta}{\pi}}$ b) $V_s\sqrt{\frac{\delta}{p\pi}}$ c) $V_s\sqrt{\frac{\pi\delta}{p}}$ d) $V_s\sqrt{\frac{p}{\delta\pi}}$

14) In single phase full bridge inverter has dc input voltage is 250 V, RMS output voltage will be
   a) 250 V b) 125 V c) 176.77 V d) 500 V

15) The concept of V/f control of inverters driving induction motors results in
   a) Constant torque operation b) Speed reversal
   c) Reduced magnetic loss d) Harmonic elimination

16) A converter which can operate as 6-pulse converter is a
   a) 3-phase half wave b) 3-phase full-converter
   c) 3-phase semiconverter d) both b) and c)

17) Three phase half wave controlled rectifier is connected to a 3ϕ 440 V, 50 Hz AC source. Output ripple frequency will be
   a) 50 Hz b) 150 Hz c) 300 Hz d) 25 Hz

18) In three phase full converter PIV across any thyristor is
   a) $\sqrt{2}V_{LL}$ b) $\sqrt{3}V_m$ c) $\sqrt{3}V_{LL}$ d) Both a) and b)

19) Four quadrant converters are
   a) Dual converter b) Class E chopper
   c) Both a) and b) d) Single phase controlled converter

20) In _____ chopper load current is always positive and load voltage is positive or negative.
   a) Class D b) Class A c) Class B d) Both a) and b)

_____

SLR-VB – 149

Seat No.	

B.E. (Electronics) (Part – I) Examination, 2017
POWER ELECTRONICS

Day and Date : Thursday, 4-5-2017 Total Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*

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

SECTION – I

2. Attempt **any four** : **(4×6=24)**

1) A three phase semiconverter is operated from 3 phase 400 V 50 Hz mains supply and delivers power to sufficiently large inductive load having resistance of $10\,\Omega$. If it is required that average output voltage should be 50% of maximum possible voltage. Calculate
   a) Firing angle
   b) Power delivered to load
   c) Thyristors rating

2) Derive an expression for the average output voltage in terms of input dc voltage and duty cycle for step up chopper.

3) Explain working of class E chopper.

4) Derive an expression for average output voltage and RMS output voltage of three phase fully controlled rectifier.

5) A three phase controlled rectifier is supplied from $3\varnothing$ 230 V, 60 Hz supply. Load current is continuous and ripple free. If Idc = 150 A and commutating inductance L_C = 0.1 mH. Calculate overlap angle when $\alpha = 10°$ and 30°.

3. Attempt **any two** : **(2×8=16)**

1) Design DSP based firing scheme for three phase controlled converters.

2) Describe the process of commutation of main thyristor by means of suitable diagram and waveforms in Jones chopper with associated voltage and current waveforms.

3) Design single phase 5 : 1 midpoint cycloconverter with resistive load. Sketch associated waveforms. Explain firing scheme to obtain approximate sinusoidal wave.

SECTION – II

4. Attempt **any four** : **(4×6=24)**

   1) Calculate resonant frequency and output frequency of series inverter circuit with following specifications. L = 10 mH, C = 0.14 μF, $R_L = 400\,\Omega$, t_{OFF} = 0.2 msec.

   2) Explain operation of single phase full bridge IGBT based voltage source inverter with inductive load and sketch associate waveforms.

   3) The output voltage of single phase full bridge inverter is controlled by PWM with one pulse per half cycle.
      a) Determine the required pulse width so that rms load voltage is 70% of input dc voltage.
      b) If pulse width is 30° and input dc supply is 220 V calculate rms value of load voltage.

   4) Explain various schemes of speed control of dc motor.

   5) Compare 180° conduction mode and 120° conduction mode of 3φ transistorized bridge inverter.

5. Attempt **any two** : **(2×8=16)**

   1) With help of suitable block diagram and flowchart explain working of micro controller based four quadrant AC drive.

   2) Explain working of parallel inverter with highly inductive load. Sketch appropriate waveforms.

   3) Explain different methods for improvement of power factor corrector.

SLR-VB – 150

Seat No.	

Set P

B.E. (Electronics Engg.) (Part – I) Examination, 2017
COMPUTER NETWORKS

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 answers : **(20×1=20)**

1) NIC (Network Interface Card) is _____ layer device.
a) Physical b) Data link c) Network d) Application

2) Which type of CSMA shows the best performance ?
a) 1-persistent b) non persistent
c) p-persistent d) all mentioned

3) In extended mode of working in HDLC, the max window size is
a) 7 b) 15 c) 127 d) 255

4) Which IP Class has few hosts per network ?
a) Class A b) Class B c) Class C d) Class D

5) Which of the following is a Class-A address ?
a) 12.4.5.6 b) 130.2.5.1 c) 192.0.0.0 d) 117.8.0.0

6) The data unit in transport layer in TCP/IP is called
a) a datagram b) a segment c) frame d) bit-string

7) Which statement for TCP is false ?
a) Connection oriented transfer b) Reliable
c) Don't provide feedback d) Point to point communication

8) Process of generating network id from IP address is called
   a) Masking b) Subnetting c) Ping d) Grouping

9) The default mask for Class C IP address is
   a) 255.0.0.0 b) 255.1.1.1
   c) 255.255.255.0 d) 0.255.255.255

10) The net-id for IP address 180.2.11.24 is
   a) 180.2.11.0 b) 180.2.1.1 c) 180.2.0.0 d) 0.0.11.0

11) In _____ error correction, the receiver asks the sender to send the data again.
   a) Backward b) Forward
   c) Retransmission d) None of above

12) To generate Hamming code-word for 7 bit data word, we need _____ parity bits.
   a) 7 b) 8 c) 4 d) 5

13) In _____ protocols, we use _____
   a) byte-oriented; bit stuffing b) character-oriented; bit stuffing
   c) bit-oriented; bit stuffing d) none of above

14) The Stop-And-Wait ARQ, Go-Back-N ARQ and the Selective Repeat ARQ are for _____ channels.
   a) noiseless b) noisy c) dynamic d) static

15) TCP is _____ protocol.
   a) unreliable b) reliable
   c) best effort d) none of the above

16) If a router receives an IP packet with time to live flag '0', then that router _____
   a) accepts packet b) drops packet
   c) keeps packet in buffer d) none of the above

17) TCP is an example of _____ communication.
   a) half duplex b) full duplex
   c) simplex d) none of the above

18) Connection establishment in TCP is called _____ handshaking.
   a) one way b) two way c) three way d) none of the above

19) TCP delivers _____ out-of-order segments to the process.
   a) all b) zero c) some d) none of the above

20) The options field of the TCP header ranges from 0 to _____ bytes.
   a) 10 b) 20 c) 40 d) 60

_____

SLR-VB – 150

Seat No.	

B.E. (Electronics Engg.) (Part – I) Examination, 2017
COMPUTER NETWORKS

Day and Date : Friday, 5-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Answer **any four** from the following : **(4×5=20)**

   1) Write formulae to find channel capacity. Find bit and baud rate for a signal which uses two bits in each signal element and sent at the rate of 1500 elements/ second over the channel.

   2) What is the difference between error correction and error detection mechanisms ? Describe CRC algorithm to find checksum and transmitted bit string.

   3) What is network topology ? Describe various network topologies in brief.

   4) What is medium access control ? Explain different CSMA mechanism in brief.

   5) Calculate Hamming code-word for an ascii character 'K' – 1001011. Assume even parity during transmission.

3. Answer **any two** from the following : **(2×10=20)**

   1) What is the need of flow control ? Explain stop_and_wait flow control mechanism in detail. Find formula for link utilization efficiency for the same. A channel has bit rate of 4 Kbps and propagation delay of 20 msec. Find minimum frame size to have 50% link utilization efficiency in case of stop_and_wait flow control mechanism.

   2) What are collision oriented, collision less and limited contention protocols for medium access control ? Explain bit map and binary countdown protocols in detail.

   3) Describe IEEE 802.3 MAC sublayer in detail.

SECTION – II

4. Answer **any four** from the following : **(4×5=20)**

   1) What is dotted decimal notation in IPv4 ? Draw and describe special IPv4 Address formats.

   2) What is the meaning of default mask ? Find net-id and host-id for '137.7.21.64' and '221.46.75.64'.

   3) Explain in brief client server communication.

   4) Differentiate between datagram and virtual circuit subnets.

   5) Draw ARP header format and explain it in detail.

5. Answer **any two** from the following : **(2×10=20)**

   1) Draw TCP header format and describe working of each field in detail.

   2) What are physical, logical and port address related to TCP/IP ? Draw UDP datagram format and explain.

   3) Explain floe based routing protocol in detail.

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SLR-VB – 150

Seat No.	

Set Q

B.E. (Electronics Engg.) (Part – I) Examination, 2017
COMPUTER NETWORKS

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 answers : **(20×1=20)**

1) If a router receives an IP packet with time to live flag '0', then that router _____
   a) accepts packet b) drops packet
   c) keeps packet in buffer d) none of the above

2) TCP is an example of _____ communication.
   a) half duplex b) full duplex
   c) simplex d) none of the above

3) Connection establishment in TCP is called _____ handshaking.
   a) one way b) two way c) three way d) none of the above

4) TCP delivers _____ out-of-order segments to the process.
   a) all b) zero c) some d) none of the above

5) The options field of the TCP header ranges from 0 to _____ bytes.
   a) 10 b) 20 c) 40 d) 60

6) NIC (Network Interface Card) is _____ layer device.
   a) Physical b) Data link c) Network d) Application

7) Which type of CSMA shows the best performance ?
   a) 1-persistent b) non persistent
   c) p-persistent d) all mentioned

P.T.O.

8) In extended mode of working in HDLC, the max window size is
a) 7 b) 15 c) 127 d) 255

9) Which IP Class has few hosts per network ?
a) Class A b) Class B c) Class C d) Class D

10) Which of the following is a Class-A address ?
a) 12.4.5.6 b) 130.2.5.1 c) 192.0.0.0 d) 117.8.0.0

11) The data unit in transport layer in TCP/IP is called
a) a datagram b) a segment c) frame d) bit-string

12) Which statement for TCP is false ?
a) Connection oriented transfer b) Reliable
c) Don't provide feedback d) Point to point communication

13) Process of generating network id from IP address is called
a) Masking b) Subnetting c) Ping d) Grouping

14) The default mask for Class C IP address is
a) 255.0.0.0 b) 255.1.1.1
c) 255.255.255.0 d) 0.255.255.255

15) The net-id for IP address 180.2.11.24 is
a) 180.2.11.0 b) 180.2.1.1 c) 180.2.0.0 d) 0.0.11.0

16) In _____ error correction, the receiver asks the sender to send the data again.
a) Backward b) Forward
c) Retransmission d) None of above

17) To generate Hamming code-word for 7 bit data word, we need _____ parity bits.
a) 7 b) 8 c) 4 d) 5

18) In _____ protocols, we use _____
a) byte-oriented; bit stuffing b) character-oriented; bit stuffing
c) bit-oriented; bit stuffing d) none of above

19) The Stop-And-Wait ARQ, Go-Back-N ARQ and the Selective Repeat ARQ are for _____ channels.
a) noiseless b) noisy c) dynamic d) static

20) TCP is _____ protocol.
a) unreliable b) reliable
c) best effort d) none of the above

SLR-VB – 150

Seat No.	

B.E. (Electronics Engg.) (Part – I) Examination, 2017
COMPUTER NETWORKS

Day and Date : Friday, 5-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Answer **any four** from the following : **(4×5=20)**

   1) Write formulae to find channel capacity. Find bit and baud rate for a signal which uses two bits in each signal element and sent at the rate of 1500 elements/ second over the channel.

   2) What is the difference between error correction and error detection mechanisms ? Describe CRC algorithm to find checksum and transmitted bit string.

   3) What is network topology ? Describe various network topologies in brief.

   4) What is medium access control ? Explain different CSMA mechanism in brief.

   5) Calculate Hamming code-word for an ascii character 'K' – 1001011. Assume even parity during transmission.

3. Answer **any two** from the following : **(2×10=20)**

   1) What is the need of flow control ? Explain stop_and_wait flow control mechanism in detail. Find formula for link utilization efficiency for the same. A channel has bit rate of 4 Kbps and propagation delay of 20 msec. Find minimum frame size to have 50% link utilization efficiency in case of stop_and_wait flow control mechanism.

   2) What are collision oriented, collision less and limited contention protocols for medium access control ? Explain bit map and binary countdown protocols in detail.

   3) Describe IEEE 802.3 MAC sublayer in detail.

SECTION – II

4. Answer **any four** from the following : **(4×5=20)**
   1) What is dotted decimal notation in IPv4 ? Draw and describe special IPv4 Address formats.
   2) What is the meaning of default mask ? Find net-id and host-id for '137.7.21.64' and '221.46.75.64'.
   3) Explain in brief client server communication.
   4) Differentiate between datagram and virtual circuit subnets.
   5) Draw ARP header format and explain it in detail.

5. Answer **any two** from the following : **(2×10=20)**
   1) Draw TCP header format and describe working of each field in detail.
   2) What are physical, logical and port address related to TCP/IP ? Draw UDP datagram format and explain.
   3) Explain floe based routing protocol in detail.

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SLR-VB – 150

Seat No.	

Set **R**

B.E. (Electronics Engg.) (Part – I) Examination, 2017
COMPUTER NETWORKS

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 answers : **(20×1=20)**

1) In _____ error correction, the receiver asks the sender to send the data again.
   a) Backward b) Forward
   c) Retransmission d) None of above

2) To generate Hamming code-word for 7 bit data word, we need _____ parity bits.
   a) 7 b) 8 c) 4 d) 5

3) In _____ protocols, we use _____
   a) byte-oriented; bit stuffing b) character-oriented; bit stuffing
   c) bit-oriented; bit stuffing d) none of above

4) The Stop-And-Wait ARQ, Go-Back-N ARQ and the Selective Repeat ARQ are for _____ channels.
   a) noiseless b) noisy c) dynamic d) static

5) TCP is _____ protocol.
   a) unreliable b) reliable
   c) best effort d) none of the above

6) If a router receives an IP packet with time to live flag '0', then that router _____
   a) accepts packet b) drops packet
   c) keeps packet in buffer d) none of the above

P.T.O.

7) TCP is an example of _____ communication.
   a) half duplex b) full duplex
   c) simplex d) none of the above

8) Connection establishment in TCP is called _____ handshaking.
   a) one way b) two way c) three way d) none of the above

9) TCP delivers _____ out-of-order segments to the process.
   a) all b) zero c) some d) none of the above

10) The options field of the TCP header ranges from 0 to _____ bytes.
   a) 10 b) 20 c) 40 d) 60

11) NIC (Network Interface Card) is _____ layer device.
   a) Physical b) Data link c) Network d) Application

12) Which type of CSMA shows the best performance ?
   a) 1-persistent b) non persistent
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13) In extended mode of working in HDLC, the max window size is
   a) 7 b) 15 c) 127 d) 255

14) Which IP Class has few hosts per network ?
   a) Class A b) Class B c) Class C d) Class D

15) Which of the following is a Class-A address ?
   a) 12.4.5.6 b) 130.2.5.1 c) 192.0.0.0 d) 117.8.0.0

16) The data unit in transport layer in TCP/IP is called
   a) a datagram b) a segment c) frame d) bit-string

17) Which statement for TCP is false ?
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18) Process of generating network id from IP address is called
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19) The default mask for Class C IP address is
   a) 255.0.0.0 b) 255.1.1.1
   c) 255.255.255.0 d) 0.255.255.255

20) The net-id for IP address 180.2.11.24 is
   a) 180.2.11.0 b) 180.2.1.1 c) 180.2.0.0 d) 0.0.11.0

SLR-VB – 150

Seat No.	

B.E. (Electronics Engg.) (Part – I) Examination, 2017
COMPUTER NETWORKS

Day and Date : Friday, 5-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Answer **any four** from the following : **(4×5=20)**

   1) Write formulae to find channel capacity. Find bit and baud rate for a signal which uses two bits in each signal element and sent at the rate of 1500 elements/ second over the channel.

   2) What is the difference between error correction and error detection mechanisms ? Describe CRC algorithm to find checksum and transmitted bit string.

   3) What is network topology ? Describe various network topologies in brief.

   4) What is medium access control ? Explain different CSMA mechanism in brief.

   5) Calculate Hamming code-word for an ascii character 'K' – 1001011. Assume even parity during transmission.

3. Answer **any two** from the following : **(2×10=20)**

   1) What is the need of flow control ? Explain stop_and_wait flow control mechanism in detail. Find formula for link utilization efficiency for the same. A channel has bit rate of 4 Kbps and propagation delay of 20 msec. Find minimum frame size to have 50% link utilization efficiency in case of stop_and_wait flow control mechanism.

   2) What are collision oriented, collision less and limited contention protocols for medium access control ? Explain bit map and binary countdown protocols in detail.

   3) Describe IEEE 802.3 MAC sublayer in detail.

SECTION – II

4. Answer **any four** from the following : **(4×5=20)**

   1) What is dotted decimal notation in IPv4 ? Draw and describe special IPv4 Address formats.

   2) What is the meaning of default mask ? Find net-id and host-id for '137.7.21.64' and '221.46.75.64'.

   3) Explain in brief client server communication.

   4) Differentiate between datagram and virtual circuit subnets.

   5) Draw ARP header format and explain it in detail.

5. Answer **any two** from the following : **(2×10=20)**

   1) Draw TCP header format and describe working of each field in detail.

   2) What are physical, logical and port address related to TCP/IP ? Draw UDP datagram format and explain.

   3) Explain floe based routing protocol in detail.

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SLR-VB – 150

Seat No.	

Set S

B.E. (Electronics Engg.) (Part – I) Examination, 2017
COMPUTER NETWORKS

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 answers : **(20×1=20)**

1) The data unit in transport layer in TCP/IP is called
a) a datagram b) a segment c) frame d) bit-string

2) Which statement for TCP is false ?
a) Connection oriented transfer b) Reliable
c) Don't provide feedback d) Point to point communication

3) Process of generating network id from IP address is called
a) Masking b) Subnetting c) Ping d) Grouping

4) The default mask for Class C IP address is
a) 255.0.0.0 b) 255.1.1.1
c) 255.255.255.0 d) 0.255.255.255

5) The net-id for IP address 180.2.11.24 is
a) 180.2.11.0 b) 180.2.1.1 c) 180.2.0.0 d) 0.0.11.0

6) In _____ error correction, the receiver asks the sender to send the data again.
a) Backward b) Forward
c) Retransmission d) None of above

7) To generate Hamming code-word for 7 bit data word, we need _____ parity bits.
a) 7 b) 8 c) 4 d) 5

P.T.O.

8) In _____ protocols, we use _____
   a) byte-oriented; bit stuffing
   b) character-oriented; bit stuffing
   c) bit-oriented; bit stuffing
   d) none of above

9) The Stop-And-Wait ARQ, Go-Back-N ARQ and the Selective Repeat ARQ are for _____ channels.
   a) noiseless b) noisy c) dynamic d) static

10) TCP is _____ protocol.
   a) unreliable
   b) reliable
   c) best effort
   d) none of the above

11) If a router receives an IP packet with time to live flag '0', then that router _____
   a) accepts packet
   b) drops packet
   c) keeps packet in buffer
   d) none of the above

12) TCP is an example of _____ communication.
   a) half duplex
   b) full duplex
   c) simplex
   d) none of the above

13) Connection establishment in TCP is called _____ handshaking.
   a) one way b) two way c) three way d) none of the above

14) TCP delivers _____ out-of-order segments to the process.
   a) all b) zero c) some d) none of the above

15) The options field of the TCP header ranges from 0 to _____ bytes.
   a) 10 b) 20 c) 40 d) 60

16) NIC (Network Interface Card) is _____ layer device.
   a) Physical b) Data link c) Network d) Application

17) Which type of CSMA shows the best performance ?
   a) 1-persistent
   b) non persistent
   c) p-persistent
   d) all mentioned

18) In extended mode of working in HDLC, the max window size is
   a) 7 b) 15 c) 127 d) 255

19) Which IP Class has few hosts per network ?
   a) Class A b) Class B c) Class C d) Class D

20) Which of the following is a Class-A address ?
   a) 12.4.5.6 b) 130.2.5.1 c) 192.0.0.0 d) 117.8.0.0

_____

SLR-VB – 150

Seat No.	

B.E. (Electronics Engg.) (Part – I) Examination, 2017
COMPUTER NETWORKS

Day and Date : Friday, 5-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Answer **any four** from the following : **(4×5=20)**

   1) Write formulae to find channel capacity. Find bit and baud rate for a signal which uses two bits in each signal element and sent at the rate of 1500 elements/ second over the channel.

   2) What is the difference between error correction and error detection mechanisms ? Describe CRC algorithm to find checksum and transmitted bit string.

   3) What is network topology ? Describe various network topologies in brief.

   4) What is medium access control ? Explain different CSMA mechanism in brief.

   5) Calculate Hamming code-word for an ascii character 'K' – 1001011. Assume even parity during transmission.

3. Answer **any two** from the following : **(2×10=20)**

   1) What is the need of flow control ? Explain stop_and_wait flow control mechanism in detail. Find formula for link utilization efficiency for the same. A channel has bit rate of 4 Kbps and propagation delay of 20 msec. Find minimum frame size to have 50% link utilization efficiency in case of stop_and_wait flow control mechanism.

   2) What are collision oriented, collision less and limited contention protocols for medium access control ? Explain bit map and binary countdown protocols in detail.

   3) Describe IEEE 802.3 MAC sublayer in detail.

SECTION – II

4. Answer **any four** from the following : **(4×5=20)**

   1) What is dotted decimal notation in IPv4 ? Draw and describe special IPv4 Address formats.

   2) What is the meaning of default mask ? Find net-id and host-id for '137.7.21.64' and '221.46.75.64'.

   3) Explain in brief client server communication.

   4) Differentiate between datagram and virtual circuit subnets.

   5) Draw ARP header format and explain it in detail.

5. Answer **any two** from the following : **(2×10=20)**

   1) Draw TCP header format and describe working of each field in detail.

   2) What are physical, logical and port address related to TCP/IP ? Draw UDP datagram format and explain.

   3) Explain floe based routing protocol in detail.

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SLR-VB– 151

Seat No.	

Set **P**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Saturday, 6-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicates* ***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 answer : **(20×1=20)**

1) Find odd man out from group – AMPS, UMTS, CDMA, BPRN.
a) AMPS b) UMTS c) CDMA d) BPRN

2) In GSM, letter 'S' means
a) Special b) System
c) Both a) and b) d) None of the above

3) The smallest inter frame spacing in MAC of 802.11 is
a) DIFS b) PIFS c) SIFS d) QIFS

4) Typical values of delay spread are
a) 3 ms to 12 ms b) 3 μs to 12 μs
c) 3 sec. to 12 sec. d) None of these

5) Bluetooth performs _____ hops per second and uses _____ hop carriers equally spaced.
a) 625 80 b) 1600 80 c) 1600 79 d) 1650 23

6) If stations sense the medium, but only transmit with a probability of y, with the station deferring to the next slot with the probability 1-y, this is
a) Non persistent CSMA b) P persistent CSMA
c) TDMA d) 1 persistent CSMA

7) Find the odd man out : IP × 4, IP × 6, mobile IP, IP × 2
a) IP × 4 b) IP × 6 c) Mobile IP d) IP × 2

P.T.O.

8) Training sequence and equalization are solutions for _____ interference.
   a) Inter symbol b) Co channel
   c) Adjacent channel d) Noise

9) A GSM superframe consists of _____ multiframes.
   a) 51 b) 26 c) 1236 d) 2, 715, 648

10) A PHY layer of 802.11 consists of
   a) LLC and MAC b) LLC and PMD
   c) PLCP and PMD d) None of the above

11) In a typical cellular system what can be a source of interference ?
   a) another mobile in the same cell b) call in neighboring cell
   c) call by other network operator d) all of these

12) Process of subdividing a congested cell into smaller cells each with its own BS is
   a) Zoning b) Sectoring c) Cell splitting d) All of these

13) Which of below is not a forward CDAMA channel ?
   a) paging b) sync c) pilot d) control

14) Take odd man out : tunneling, encapsulation, decapsulation, registration
   a) tunneling b) encapsulation c) decapsulation d) registration

15) A collection of bluetooth devices which are synchronized to the same hopping sequence is called
   a) Piconet b) Scatternet
   c) Parked net d) No such network exists

16) In IEEE 802.11 DSSS spreading is achieved using
   a) Walsh code b) Training sequence
   c) Barker sequence d) None of the above

17) E-mail is an example of _____ mobility.
   a) device b) user c) session d) all of these

18) _____ have been evolved as a set of air radio interface at 10 GHz – 66 GHz band on a common MAC protocol layer.
   a) IEEE 802.11 b) Bluetooth c) IEEE 802.15 d) IEEE 802.16

19) In GSM, Frequency Correction (FCCH) and synchronization (SCH) are the sub channels of _____ channel.
   a) Common b) Dedicated control
   c) Broadcast control d) Traffic

20) A3 and A5 are _____ used in GSM.
   a) Ciphering algorithms b) Equalization techniques
   c) Traffic channels d) Block interleaving

_____

SLR-VB– 151

Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Saturday, 6-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. a) What is microcell zone concept ? With suitable example show how it improves capacity in a cellular system. **10**
   b) Discuss different signal propagation effects. **10**

   OR

   c) Discuss signal processing in a GSM system. **10**

3. Solve **any four** : **(4×5=20)**
   a) With suitable diagram explain a spreading and dispreading operation.
   b) With suitable example evaluate effect of Δ (delta) on handoff.
   c) What are the different modes of radio wave propagation ?
   d) Prove slotted ALOHA is better than ALOHA.
   e) Justify use of different channels used in forward link of CDMA.

SECTION – II

4. a) With suitable example describe design goals of wireless LAN (WLAN). **10**
   b) Why there different MAC algorithm timing slots used ? Justify. **10**

   OR

   c) Discuss different core and profile specifications of bluetooth. **10**

5. Solve **any four** : **(4×5=20)**

   a) Why agent solicitation is required ?

   b) Compare master, slave, parked and standby modes of bluetooth.

   c) Discuss general features of WiMax.

   d) What are the different options available for PHY realization of WLAN ? Compare their performance.

   e) Select a suitable network and architecture for below applications. You may use wired/wireless network like WiMax, IEEE 802.3, IEEE 802.11, Bluetooth etc. Justify your selection.

      1) Network in a jewellery shop to distribute online catalog to customers.
      2) Sharing a song amongst two mobile phones in a room.
      3) Providing a Internet on laptops for students in college campus.
      4) Providing a wireless TV service to a residential colony.
      5) Providing an Internet services to four PDAs in a home.

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Seat No.	

Set **Q**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Saturday, 6-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicates* ***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 answer : **(20×1=20)**

1) In IEEE 802.11 DSSS spreading is achieved using
   a) Walsh code b) Training sequence
   c) Barker sequence d) None of the above

2) E-mail is an example of _____ mobility.
   a) device b) user c) session d) all of these

3) _____ have been evolved as a set of air radio interface at 10 GHz – 66 GHz band on a common MAC protocol layer.
   a) IEEE 802.11 b) Bluetooth c) IEEE 802.15 d) IEEE 802.16

4) In GSM, Frequency Correction (FCCH) and synchronization (SCH) are the sub channels of _____ channel.
   a) Common b) Dedicated control
   c) Broadcast control d) Traffic

5) A3 and A5 are _____ used in GSM.
   a) Ciphering algorithms b) Equalization techniques
   c) Traffic channels d) Block interleaving

6) Find odd man out from group – AMPS, UMTS, CDMA, BPRN.
   a) AMPS b) UMTS c) CDMA d) BPRN

7) In GSM, letter 'S' means
   a) Special b) System
   c) Both a) and b) d) None of the above

P.T.O.

8) The smallest inter frame spacing in MAC of 802.11 is
a) DIFS b) PIFS c) SIFS d) QIFS

9) Typical values of delay spread are
a) 3 ms to 12 ms b) 3 μs to 12 μs
c) 3 sec. to 12 sec. d) None of these

10) Bluetooth performs _____ hops per second and uses _____ hop carriers equally spaced.
a) 625 80 b) 1600 80 c) 1600 79 d) 1650 23

11) If stations sense the medium, but only transmit with a probability of y, with the station deferring to the next slot with the probability 1-y, this is
a) Non persistent CSMA b) P persistent CSMA
c) TDMA d) 1 persistent CSMA

12) Find the odd man out : IP × 4, IP × 6, mobile IP, IP × 2
a) IP × 4 b) IP × 6 c) Mobile IP d) IP × 2

13) Training sequence and equalization are solutions for _____ interference.
a) Inter symbol b) Co channel
c) Adjacent channel d) Noise

14) A GSM superframe consists of _____ multiframes.
a) 51 b) 26 c) 1236 d) 2, 715, 648

15) A PHY layer of 802.11 consists of
a) LLC and MAC b) LLC and PMD
c) PLCP and PMD d) None of the above

16) In a typical cellular system what can be a source of interference ?
a) another mobile in the same cell b) call in neighboring cell
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17) Process of subdividing a congested cell into smaller cells each with its own BS is
a) Zoning b) Sectoring c) Cell splitting d) All of these

18) Which of below is not a forward CDAMA channel ?
a) paging b) sync c) pilot d) control

19) Take odd man out : tunneling, encapsulation, decapsulation, registration
a) tunneling b) encapsulation c) decapsulation d) registration

20) A collection of bluetooth devices which are synchronized to the same hopping sequence is called
a) Piconet b) Scatternet
c) Parked net d) No such network exists

_____

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Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Saturday, 6-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. a) What is microcell zone concept ? With suitable example show how it improves capacity in a cellular system. **10**
   b) Discuss different signal propagation effects. **10**

   OR

   c) Discuss signal processing in a GSM system. **10**

3. Solve **any four** : **(4×5=20)**
   a) With suitable diagram explain a spreading and dispreading operation.
   b) With suitable example evaluate effect of Δ (delta) on handoff.
   c) What are the different modes of radio wave propagation ?
   d) Prove slotted ALOHA is better than ALOHA.
   e) Justify use of different channels used in forward link of CDMA.

SECTION – II

4. a) With suitable example describe design goals of wireless LAN (WLAN). **10**
   b) Why there different MAC algorithm timing slots used ? Justify. **10**

   OR

   c) Discuss different core and profile specifications of bluetooth. **10**

Set Q

5. Solve **any four** : **(4×5=20)**

   a) Why agent solicitation is required ?

   b) Compare master, slave, parked and standby modes of bluetooth.

   c) Discuss general features of WiMax.

   d) What are the different options available for PHY realization of WLAN ? Compare their performance.

   e) Select a suitable network and architecture for below applications. You may use wired/wireless network like WiMax, IEEE 802.3, IEEE 802.11, Bluetooth etc. Justify your selection.

      1) Network in a jewellery shop to distribute online catalog to customers.

      2) Sharing a song amongst two mobile phones in a room.

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      4) Providing a wireless TV service to a residential colony.

      5) Providing an Internet services to four PDAs in a home.

SLR-VB– 151

Seat No.	

Set **R**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Saturday, 6-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
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5) ***Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) In a typical cellular system what can be a source of interference ?
a) another mobile in the same cell b) call in neighboring cell
c) call by other network operator d) all of these

2) Process of subdividing a congested cell into smaller cells each with its own BS is
a) Zoning b) Sectoring c) Cell splitting d) All of these

3) Which of below is not a forward CDAMA channel ?
a) paging b) sync c) pilot d) control

4) Take odd man out : tunneling, encapsulation, decapsulation, registration
a) tunneling b) encapsulation c) decapsulation d) registration

5) A collection of bluetooth devices which are synchronized to the same hopping sequence is called
a) Piconet b) Scatternet
c) Parked net d) No such network exists

6) In IEEE 802.11 DSSS spreading is achieved using
a) Walsh code b) Training sequence
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7) E-mail is an example of _____ mobility.
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P.T.O.

8) _____ have been evolved as a set of air radio interface at 10 GHz – 66 GHz band on a common MAC protocol layer.
a) IEEE 802.11 b) Bluetooth c) IEEE 802.15 d) IEEE 802.16

9) In GSM, Frequency Correction (FCCH) and synchronization (SCH) are the sub channels of _____ channel.
a) Common b) Dedicated control
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10) A3 and A5 are _____ used in GSM.
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11) Find odd man out from group – AMPS, UMTS, CDMA, BPRN.
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12) In GSM, letter 'S' means
a) Special b) System
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13) The smallest inter frame spacing in MAC of 802.11 is
a) DIFS b) PIFS c) SIFS d) QIFS

14) Typical values of delay spread are
a) 3 ms to 12 ms b) 3 μs to 12 μs
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15) Bluetooth performs _____ hops per second and uses _____ hop carriers equally spaced.
a) 625 80 b) 1600 80 c) 1600 79 d) 1650 23

16) If stations sense the medium, but only transmit with a probability of y, with the station deferring to the next slot with the probability 1-y, this is
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19) A GSM superframe consists of _____ multiframes.
a) 51 b) 26 c) 1236 d) 2, 715, 648

20) A PHY layer of 802.11 consists of
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_____

SLR-VB– 151

Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Saturday, 6-5-2017 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. a) What is microcell zone concept ? With suitable example show how it improves capacity in a cellular system. **10**
   b) Discuss different signal propagation effects. **10**

   OR

   c) Discuss signal processing in a GSM system. **10**

3. Solve **any four** : **(4×5=20)**
   a) With suitable diagram explain a spreading and dispreading operation.
   b) With suitable example evaluate effect of Δ (delta) on handoff.
   c) What are the different modes of radio wave propagation ?
   d) Prove slotted ALOHA is better than ALOHA.
   e) Justify use of different channels used in forward link of CDMA.

SECTION – II

4. a) With suitable example describe design goals of wireless LAN (WLAN). **10**
   b) Why there different MAC algorithm timing slots used ? Justify. **10**

   OR

   c) Discuss different core and profile specifications of bluetooth. **10**

Set R

5. Solve **any four** : **(4×5=20)**

   a) Why agent solicitation is required ?

   b) Compare master, slave, parked and standby modes of bluetooth.

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   d) What are the different options available for PHY realization of WLAN ? Compare their performance.

   e) Select a suitable network and architecture for below applications. You may use wired/wireless network like WiMax, IEEE 802.3, IEEE 802.11, Bluetooth etc. Justify your selection.

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      2) Sharing a song amongst two mobile phones in a room.
      3) Providing a Internet on laptops for students in college campus.
      4) Providing a wireless TV service to a residential colony.
      5) Providing an Internet services to four PDAs in a home.

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SLR-VB– 151

Seat No.	

Set S

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Saturday, 6-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
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3) Assume ***suitable*** *data if 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 answer : **(20×1=20)**

1) If stations sense the medium, but only transmit with a probability of y, with the station deferring to the next slot with the probability 1-y, this is
   a) Non persistent CSMA b) P persistent CSMA
   c) TDMA d) 1 persistent CSMA

2) Find the odd man out : IP × 4, IP × 6, mobile IP, IP × 2
   a) IP × 4 b) IP × 6 c) Mobile IP d) IP × 2

3) Training sequence and equalization are solutions for _____ interference.
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4) A GSM superframe consists of _____ multiframes.
   a) 51 b) 26 c) 1236 d) 2, 715, 648

5) A PHY layer of 802.11 consists of
   a) LLC and MAC b) LLC and PMD
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6) In a typical cellular system what can be a source of interference ?
   a) another mobile in the same cell b) call in neighboring cell
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P.T.O.

7) Process of subdividing a congested cell into smaller cells each with its own BS is
a) Zoning b) Sectoring c) Cell splitting d) All of these

8) Which of below is not a forward CDAMA channel ?
a) paging b) sync c) pilot d) control

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10) A collection of bluetooth devices which are synchronized to the same hopping sequence is called
a) Piconet b) Scatternet
c) Parked net d) No such network exists

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15) A3 and A5 are _____ used in GSM.
a) Ciphering algorithms b) Equalization techniques
c) Traffic channels d) Block interleaving

16) Find odd man out from group – AMPS, UMTS, CDMA, BPRN.
a) AMPS b) UMTS c) CDMA d) BPRN

17) In GSM, letter 'S' means
a) Special b) System
c) Both a) and b) d) None of the above

18) The smallest inter frame spacing in MAC of 802.11 is
a) DIFS b) PIFS c) SIFS d) QIFS

19) Typical values of delay spread are
a) 3 ms to 12 ms b) 3 μs to 12 μs
c) 3 sec. to 12 sec. d) None of these

20) Bluetooth performs _____ hops per second and uses _____ hop carriers equally spaced.
a) 625 80 b) 1600 80 c) 1600 79 d) 1650 23

SLR-VB– 151

Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Saturday, 6-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. a) What is microcell zone concept ? With suitable example show how it improves capacity in a cellular system. **10**
   b) Discuss different signal propagation effects. **10**

   OR

   c) Discuss signal processing in a GSM system. **10**

3. Solve **any four** : **(4×5=20)**
   a) With suitable diagram explain a spreading and dispreading operation.
   b) With suitable example evaluate effect of Δ (delta) on handoff.
   c) What are the different modes of radio wave propagation ?
   d) Prove slotted ALOHA is better than ALOHA.
   e) Justify use of different channels used in forward link of CDMA.

SECTION – II

4. a) With suitable example describe design goals of wireless LAN (WLAN). **10**
   b) Why there different MAC algorithm timing slots used ? Justify. **10**

   OR

   c) Discuss different core and profile specifications of bluetooth. **10**

Set S

5. Solve **any four** : **(4×5=20)**

   a) Why agent solicitation is required ?

   b) Compare master, slave, parked and standby modes of bluetooth.

   c) Discuss general features of WiMax.

   d) What are the different options available for PHY realization of WLAN ? Compare their performance.

   e) Select a suitable network and architecture for below applications. You may use wired/wireless network like WiMax, IEEE 802.3, IEEE 802.11, Bluetooth etc. Justify your selection.

      1) Network in a jewellery shop to distribute online catalog to customers.
      2) Sharing a song amongst two mobile phones in a room.
      3) Providing a Internet on laptops for students in college campus.
      4) Providing a wireless TV service to a residential colony.
      5) Providing an Internet services to four PDAs in a home.

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SLR-VB – 152

Seat No.	

Set P

B.E. (Electronics Engineering) (Part – I) Examination, 2017
ELECTRONIC SYSTEM DESIGN

Day and Date : Monday, 8-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

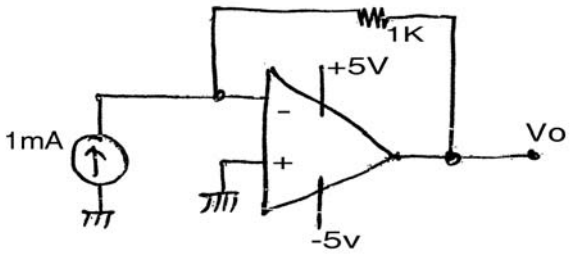
Instructions : *1) Q. No.* ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***two*** *marks.*
2) ***Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer :

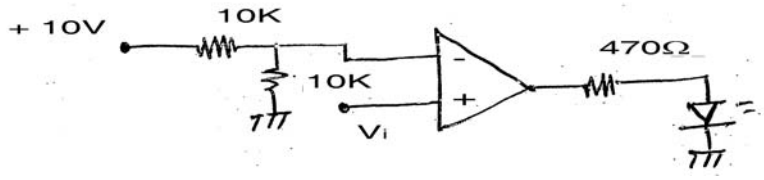
1) In the circuit shown in the figure, uses an ideal OPAMP working with +5V and –5V power supplies. The output voltage Vo is



a) + 5V b) –5V c) +1V d) –1V

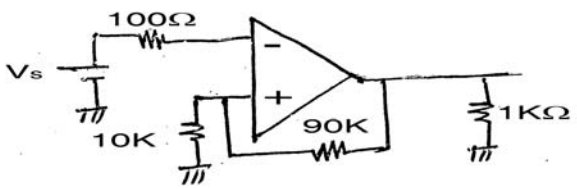
2) Fuses are divided into three categories such as fast blow, slow blow and time delay depending on
a) current rating b) voltage rating
c) response time to over current d) voltage and current rating

3) In the circuit shown in the Fig., LED will be ON if Vi is



a) >10V b) 5V c) >5V d) <5V

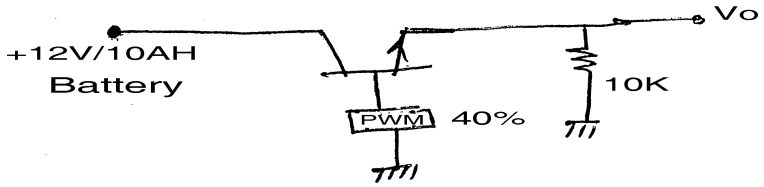
4) What is the feedback factor of following circuit ?



a) 9/100 b) 9/10 c) 1/9 d) 1/100

P.T.O.

5) What is the output of following circuit ?

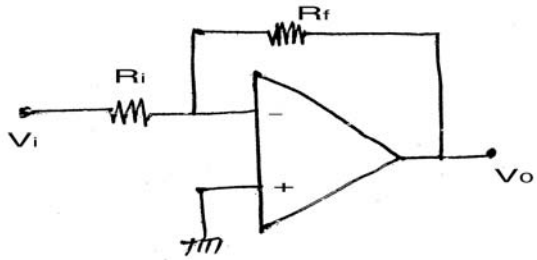


a) 58V b) 5.8V c) .58V d) none of these

6) Which of the following is self generating transducer ?

a) RTD b) PT100 c) Thermocouple d) LM335

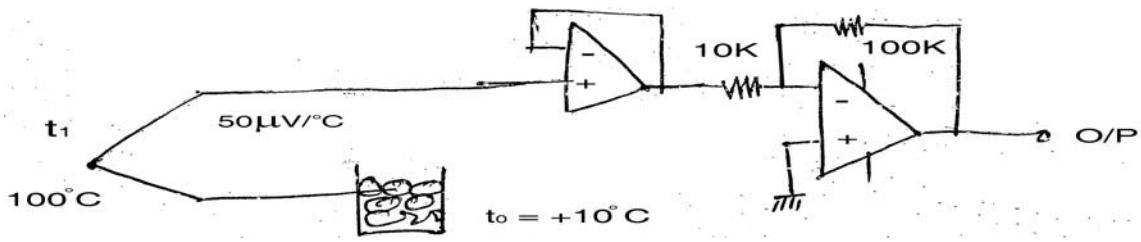
7) The circuit shown below uses



a) voltage series feedback b) voltage shunt feedback

c) current shunt feedback d) current series feedback

8) What is the output of following circuit ?



a) 4.5 V b) 4.5 mV c) 4.5 µV d) none of these

9) The main features of MOV is

a) low cost device b) high current capacity

c) no precise control of voltage d) all of these

10) TO3 package species

a) Transistor outline package b) Small outline package

c) Optical package d) J-lead package

SLR-VB – 152

Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
ELECTRONIC SYSTEM DESIGN

Day and Date : Monday, 8-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Solve **any four** : **20**

   a) Draw and explain centralized power and distributed power architecture.

   b) "The power consumption of SMPS is less" prove it mathematically.

   c) Draw the circuit diagram of four channel switching and design multiplexing logic.

   d) Design the circuit to convert 0 to 500°C to 0V ton 5V using RTD sensor.

   e) What are electronic product development stages ? Explain every stage in detail.

3. Design the following electronic product along with all component values. **20**

   The output voltage of the power supply is (6V) and rated current is (2A). This power supply is activated from battery of +24V.

   Design the SMPS will all components values and indication for Input ON, Output ON, Lower load, Input reverse along with protection circuit.

   Assume suitable values of Input/Output variation for protection circuit design. Draw final circuit and BOM.

SECTION – II

4. Solve **any four** : **20**

   a) What is software testing ? What is the different method of software testing ?

   b) What are PCB design rules ? Explain the specific care to be taken for noise while PCB designs.

c) What are different types of standards ? Give listing of standard developing organizations.

d) Draw circuit diagram of PWM using OPAMP and prepare bill of material.

e) Write short note on EMI.

5. Answer the following : **20**

a) What is design stages of hardware product ? Explain design stages of any electronic product.

b) Give in detail algorithm for software product development process. Explain with any suitable example.

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SLR-VB – 152

Seat No.	

Set **Q**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
ELECTRONIC SYSTEM DESIGN

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

MCQ/Objective Type Questions

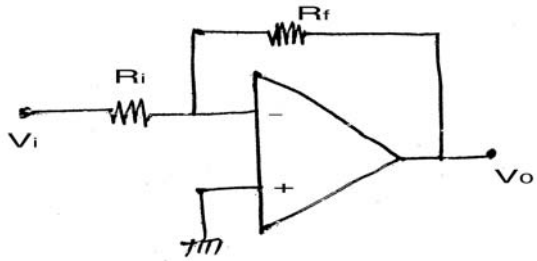
Duration : 30 Minutes Marks : 20

1. Choose the correct answer :

1) The main features of MOV is
   a) low cost device
   b) high current capacity
   c) no precise control of voltage
   d) all of these

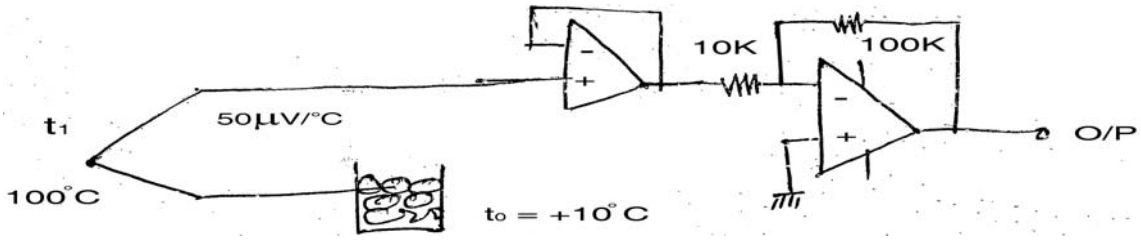
2) TO3 package species
   a) Transistor outline package
   b) Small outline package
   c) Optical package
   d) J-lead package

3) The circuit shown below uses



   a) voltage series feedback
   b) voltage shunt feedback
   c) current shunt feedback
   d) current series feedback

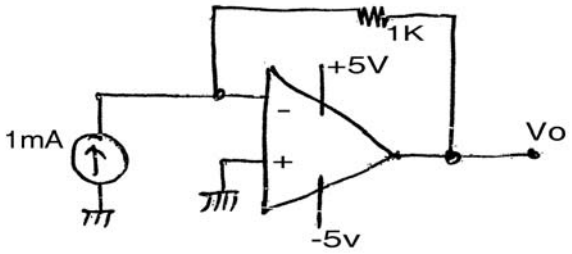
4) What is the output of following circuit ?



   a) 4.5 V
   b) 4.5 mV
   c) 4.5 μV
   d) none of these

P.T.O.

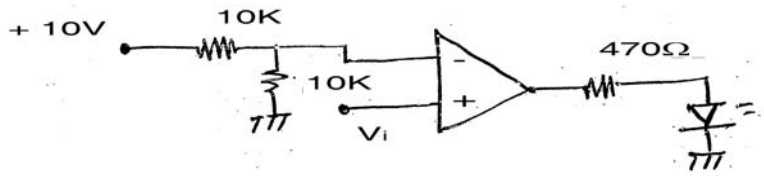
5) In the circuit shown in the figure, uses an ideal OPAMP working with +5V and –5V power supplies. The output voltage Vo is



a) + 5V b) –5V c) +1V d) –1V

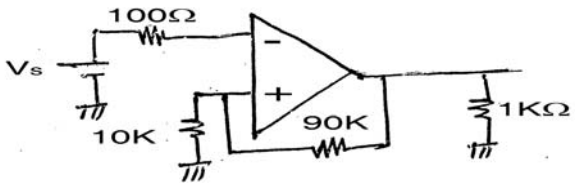
6) Fuses are divided into three categories such as fast blow, slow blow and time delay depending on
a) current rating b) voltage rating
c) response time to over current d) voltage and current rating

7) In the circuit shown in the Fig., LED will be ON if Vi is



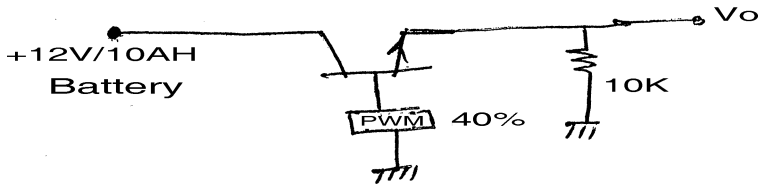
a) >10V b) 5V c) >5V d) <5V

8) What is the feedback factor of following circuit ?



a) 9/100 b) 9/10 c) 1/9 d) 1/100

9) What is the output of following circuit ?



a) 58V b) 5.8V c) .58V d) none of these

10) Which of the following is self generating transducer ?
a) RTD b) PT100 c) Thermocouple d) LM335

SLR-VB – 152

Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
ELECTRONIC SYSTEM DESIGN

Day and Date : Monday, 8-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Solve **any four** : **20**

   a) Draw and explain centralized power and distributed power architecture.

   b) "The power consumption of SMPS is less" prove it mathematically.

   c) Draw the circuit diagram of four channel switching and design multiplexing logic.

   d) Design the circuit to convert 0 to 500°C to 0V ton 5V using RTD sensor.

   e) What are electronic product development stages ? Explain every stage in detail.

3. Design the following electronic product along with all component values. **20**

   The output voltage of the power supply is (6V) and rated current is (2A). This power supply is activated from battery of +24V.

   Design the SMPS will all components values and indication for Input ON, Output ON, Lower load, Input reverse along with protection circuit.

   Assume suitable values of Input/Output variation for protection circuit design. Draw final circuit and BOM.

SECTION – II

4. Solve **any four** : **20**

   a) What is software testing ? What is the different method of software testing ?

   b) What are PCB design rules ? Explain the specific care to be taken for noise while PCB designs.

c) What are different types of standards ? Give listing of standard developing organizations.

d) Draw circuit diagram of PWM using OPAMP and prepare bill of material.

e) Write short note on EMI.

5. Answer the following : **20**

a) What is design stages of hardware product ? Explain design stages of any electronic product.

b) Give in detail algorithm for software product development process. Explain with any suitable example.

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SLR-VB – 152

Seat No.	

Set **R**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
ELECTRONIC SYSTEM DESIGN

Day and Date : Monday, 8-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

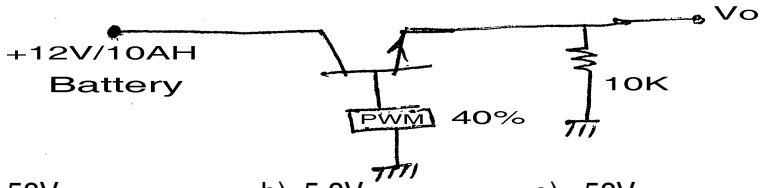
Instructions : *1) Q. No.* ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***two*** *marks.*
2) ***Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer :

1) What is the output of following circuit ?



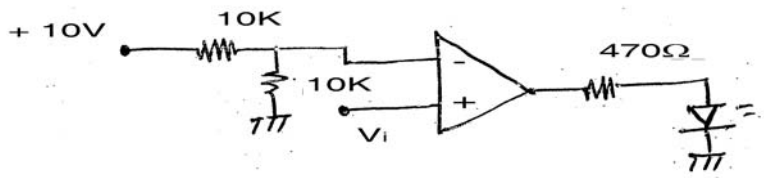
a) 58V b) 5.8V c) .58V d) none of these

2) Which of the following is self generating transducer ?
a) RTD b) PT100 c) Thermocouple d) LM335

3) The main features of MOV is
a) low cost device b) high current capacity
c) no precise control of voltage d) all of these

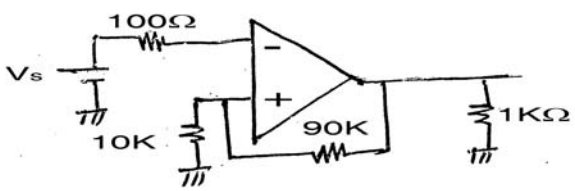
4) TO3 package species
a) Transistor outline package b) Small outline package
c) Optical package d) J-lead package

5) In the circuit shown in the Fig., LED will be ON if Vi is



a) >10V b) 5V c) >5V d) <5V

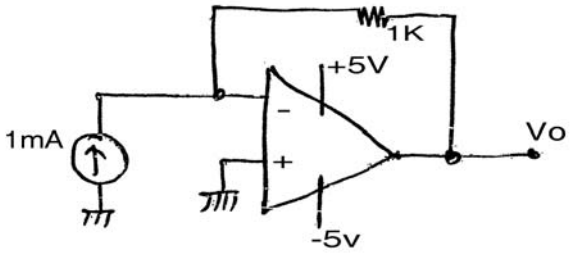
6) What is the feedback factor of following circuit ?



a) 9/100 b) 9/10 c) 1/9 d) 1/100

P.T.O.

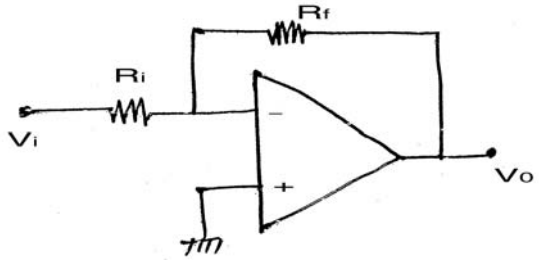
7) In the circuit shown in the figure, uses an ideal OPAMP working with +5V and –5V power supplies. The output voltage Vo is



a) + 5V b) – 5V c) +1V d) –1V

8) Fuses are divided into three categories such as fast blow, slow blow and time delay depending on
a) current rating b) voltage rating
c) response time to over current d) voltage and current rating

9) The circuit shown below uses



a) voltage series feedback b) voltage shunt feedback
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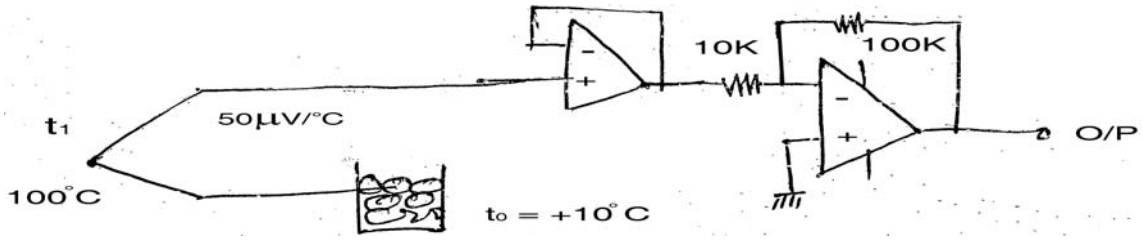
10) What is the output of following circuit ?



a) 4.5 V b) 4.5 mV c) 4.5 μV d) none of these

SLR-VB – 152

Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
ELECTRONIC SYSTEM DESIGN

Day and Date : Monday, 8-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Solve **any four** : **20**

   a) Draw and explain centralized power and distributed power architecture.

   b) "The power consumption of SMPS is less" prove it mathematically.

   c) Draw the circuit diagram of four channel switching and design multiplexing logic.

   d) Design the circuit to convert 0 to 500°C to 0V ton 5V using RTD sensor.

   e) What are electronic product development stages ? Explain every stage in detail.

3. Design the following electronic product along with all component values. **20**

   The output voltage of the power supply is (6V) and rated current is (2A). This power supply is activated from battery of +24V.

   Design the SMPS will all components values and indication for Input ON, Output ON, Lower load, Input reverse along with protection circuit.

   Assume suitable values of Input/Output variation for protection circuit design. Draw final circuit and BOM.

SECTION – II

4. Solve **any four** : **20**

   a) What is software testing ? What is the different method of software testing ?

   b) What are PCB design rules ? Explain the specific care to be taken for noise while PCB designs.

c) What are different types of standards ? Give listing of standard developing organizations.

d) Draw circuit diagram of PWM using OPAMP and prepare bill of material.

e) Write short note on EMI.

5. Answer the following : **20**

a) What is design stages of hardware product ? Explain design stages of any electronic product.

b) Give in detail algorithm for software product development process. Explain with any suitable example.

———————

SLR-VB – 152

Seat No.	

Set **S**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
ELECTRONIC SYSTEM DESIGN

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* ***two*** *marks.*

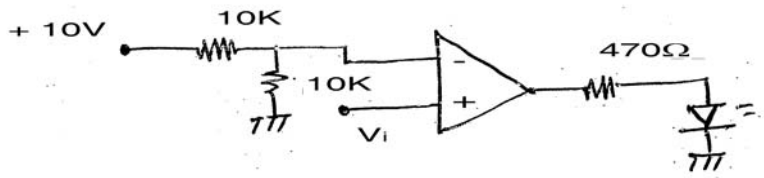
2) ***Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

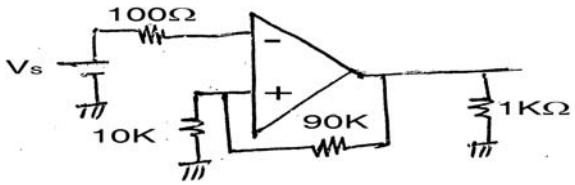
1. Choose the correct answer :

1) In the circuit shown in the Fig., LED will be ON if Vi is



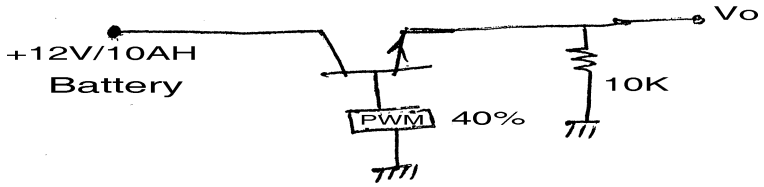
a) >10V b) 5V c) >5V d) <5V

2) What is the feedback factor of following circuit ?



a) 9/100 b) 9/10 c) 1/9 d) 1/100

3) What is the output of following circuit ?



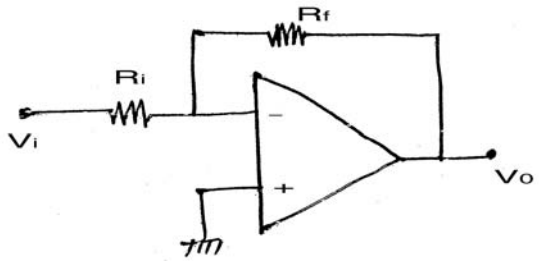
a) 58V b) 5.8V c) .58V d) none of these

4) Which of the following is self generating transducer ?

a) RTD b) PT100 c) Thermocouple d) LM335

P.T.O.

5) The circuit shown below uses



a) voltage series feedback
b) voltage shunt feedback
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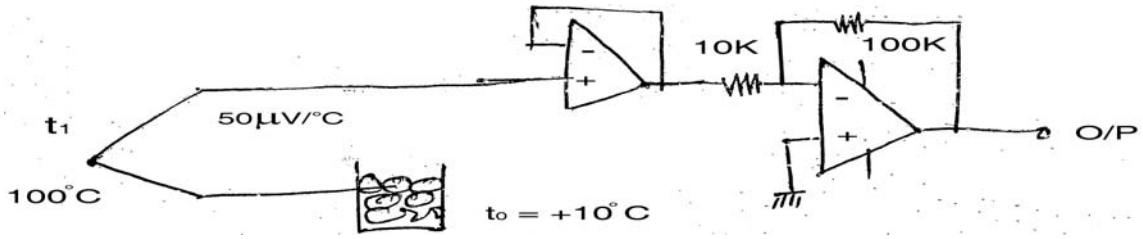
d) current series feedback

6) What is the output of following circuit ?



a) 4.5 V
b) 4.5 mV
c) 4.5 μV
d) none of these

7) The main features of MOV is
a) low cost device
b) high current capacity
c) no precise control of voltage
d) all of these

8) TO3 package species
a) Transistor outline package
b) Small outline package
c) Optical package
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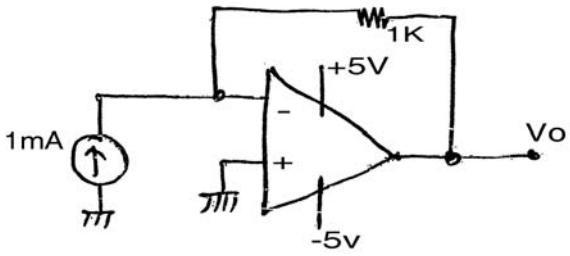
9) In the circuit shown in the figure, uses an ideal OPAMP working with +5V and –5V power supplies. The output voltage Vo is



a) + 5V
b) – 5V
c) +1V
d) –1V

10) Fuses are divided into three categories such as fast blow, slow blow and time delay depending on
a) current rating
b) voltage rating
c) response time to over current
d) voltage and current rating

SLR-VB – 152

Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
ELECTRONIC SYSTEM DESIGN

Day and Date : Monday, 8-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Solve **any four** : **20**

   a) Draw and explain centralized power and distributed power architecture.

   b) "The power consumption of SMPS is less" prove it mathematically.

   c) Draw the circuit diagram of four channel switching and design multiplexing logic.

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   e) What are electronic product development stages ? Explain every stage in detail.

3. Design the following electronic product along with all component values. **20**

   The output voltage of the power supply is (6V) and rated current is (2A). This power supply is activated from battery of +24V.

   Design the SMPS will all components values and indication for Input ON, Output ON, Lower load, Input reverse along with protection circuit.

   Assume suitable values of Input/Output variation for protection circuit design. Draw final circuit and BOM.

SECTION – II

4. Solve **any four** : **20**

   a) What is software testing ? What is the different method of software testing ?

   b) What are PCB design rules ? Explain the specific care to be taken for noise while PCB designs.

c) What are different types of standards ? Give listing of standard developing organizations.

d) Draw circuit diagram of PWM using OPAMP and prepare bill of material.

e) Write short note on EMI.

5. Answer the following : **20**

a) What is design stages of hardware product ? Explain design stages of any electronic product.

b) Give in detail algorithm for software product development process. Explain with any suitable example.

———————

SLR-VB – 154

Seat No.	

Set **P**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MECHATRONICS (Elective – I)

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

3) ***All*** *questions are* ***compulsory****.*

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

5) Assume suitable data ***wherever*** *necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) In a temperature control system, what represents the output of the system
   a) The required temperature
   b) The actual temperature achieved
   c) The heat produced by the system
   d) The heating element

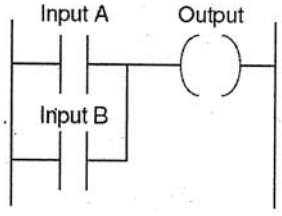
2) The term PLC stands for
   a) Personal Logic Computer b) Programmable Logic Computer
   c) Personal Logic Controller d) Programmable Logic Controller

3) _____ is a PLC function capable of storing and shifting binary data.
   a) Timer b) Shift register c) Counter d) Relay

4) With integral control, the controller output is,
   i) Zero when the error changes at a constant rate
   ii) Increases at a constant rate when the error is constant
   a) Both i and ii are true b) i is true and ii is false
   c) i is false and ii is true d) Both i and ii are false

5) The number of I/O's for micro PLC are
   a) More than 8 b) Less than 4 c) More than 16 d) More than 32

6) The ladder diagram shown below is for _____ gate.



a) AND b) NOR c) OR d) NAND

7) Different sensors are interfaced with _____ card of the PLC.
a) Memory b) Input c) Output d) Power

8) The resolution of an analogue to digital converter with a word length of 10 bits and an analogue signal input range of 10 V is
a) 9.76 mV b) 256 mV c) 1.25 mV d) 5V

9) The basic element of ON/OFF controller is
a) Amplifier b) Comparator
c) Oscillator d) Differential amplifier

10) Actuators are interfaced with _____ card of the PLC.
a) Memory b) Input c) Output d) Power

11) _____ is process, which makes it possible to selectively remove the deposited films or parts of the substrate in order to obtain desired patterns.
a) Etching b) Implantation c) Doping d) Evaporation

12) In _____ strain gages, change resistance in response to a mechanical strain.
a) Piezo-electric b) RTD
c) Piezo-resistive d) None of the above

13) For precise measurement, strain gauge must have the following properties
a) High gauge factor b) Low temperature coefficient
c) High resistance d) All of the above

14) A _____ actuator uses a pressurized air to drive a piston.
a) Hydraulic b) Pneumatic
c) Electric d) None of the above

15) _____ is a device that converts energy to mechanical motion.
a) Sensors b) Actuators c) Transducers d) Amplifiers

16) The device which provides maximum isolation is
a) Opto-isolator b) Pulse transformer
c) Normal transformer d) None of the above

17) Closed loop control systems are
i) More stable than open loop systems
ii) More complex to design than open loop systems.
a) Both i and ii are true b) i is true and ii is false
c) i is false and ii is true d) Both i and ii are false

18) In PID controller _____ parameter is responsible for oscillation.
a) KP b) PO c) KD d) KI

19) The variable frequency drive is suitable for _____ motor.
a) DC servo b) DC series c) AC d) DC shunt

20) The advantages of using the relay type output in PLC's is that
a) They allows small currents to switch large currents
b) Provides isolation to the PLC from external circuit
c) Suitable for both AC and DC switching
d) All of the above

_____

SLR-VB – 154

Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MECHATRONICS (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 ***wherever*** *necessary.*

SECTION – I

2. Attempt **any four** : **(5×4=20)**
   a) Differentiate the open loop and closed loop control system.
   b) Explain the factors considered for the selection of a PLC.
   c) What are the limitations of a two step on-off control and in what situation is such a control system commonly used ?
   d) Explain a four quadrant DC drive with neat diagram and waveforms. Estimate different specifications.
   e) Explain in detail the Functional Block Diagram (FBD) programming of a PLC.

3. Attempt **any two** : **(10×2=20)**
   a) Draw and explain the ladder diagram and the equivalent PLC instruction and truth table of NAND, NOR, XOR, and XNOR gates.
   b) Explain in detail different methods used to program PLC's with examples.
   c) Derive a mathematical model for PD controller. Explain electronic Proportional Derivative (PD) controller with necessary circuit diagrams.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   a) What is piezo-resistivity ? Explain the working of an accelerometer that uses piezo-resistivity.
   b) Draw and explain block diagram of typical MEMS system.

c) Compare hydraulic and pneumatic actuation systems with examples.
d) What is etching ? Explain in detail dry etching process.
e) What is impurity doping ? Explain diffusion doping of semiconductors.

5. Attempt **any two** : **(10×2=20)**

a) What are the differences between traditional and mechatronics designs ? Explain in detail with examples.
b) Explain the working principle of hydraulic actuation system with a neat sketch.
c) Explain in detail LIGA fabrication process for MEMS devices.

SLR-VB – 154

Seat No.	

Set **Q**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MECHATRONICS (Elective – I)

Day and Date : Tuesday, 9-5-2017 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.***
*3) **All** questions are **compulsory**.*
*4) Figures to the **right** indicate **full** marks.*
*5) Assume suitable data **wherever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) The device which provides maximum isolation is
   a) Opto-isolator b) Pulse transformer
   c) Normal transformer d) None of the above

2) Closed loop control systems are
   i) More stable than open loop systems
   ii) More complex to design than open loop systems.
   a) Both i and ii are true b) i is true and ii is false
   c) i is false and ii is true d) Both i and ii are false

3) In PID controller _____ parameter is responsible for oscillation.
   a) KP b) PO c) KD d) KI

4) The variable frequency drive is suitable for _____ motor.
   a) DC servo b) DC series c) AC d) DC shunt

5) The advantages of using the relay type output in PLC's is that
   a) They allows small currents to switch large currents
   b) Provides isolation to the PLC from external circuit
   c) Suitable for both AC and DC switching
   d) All of the above

6) In a temperature control system, what represents the output of the system
   a) The required temperature
   b) The actual temperature achieved
   c) The heat produced by the system
   d) The heating element

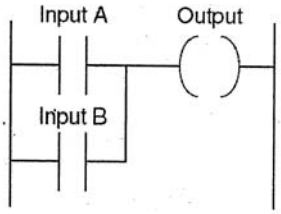
7) The term PLC stands for
   a) Personal Logic Computer b) Programmable Logic Computer
   c) Personal Logic Controller d) Programmable Logic Controller

8) _____ is a PLC function capable of storing and shifting binary data.
a) Timer b) Shift register c) Counter d) Relay

9) With integral control, the controller output is,
i) Zero when the error changes at a constant rate
ii) Increases at a constant rate when the error is constant
a) Both i and ii are true b) i is true and ii is false
c) i is false and ii is true d) Both i and ii are false

10) The number of I/O's for micro PLC are
a) More than 8 b) Less than 4 c) More than 16 d) More than 32

11) The ladder diagram shown below is for _____ gate.



a) AND b) NOR c) OR d) NAND

12) Different sensors are interfaced with _____ card of the PLC.
a) Memory b) Input c) Output d) Power

13) The resolution of an analogue to digital converter with a word length of 10 bits and an analogue signal input range of 10 V is
a) 9.76 mV b) 256 mV c) 1.25 mV d) 5V

14) The basic element of ON/OFF controller is
a) Amplifier b) Comparator
c) Oscillator d) Differential amplifier

15) Actuators are interfaced with _____ card of the PLC.
a) Memory b) Input c) Output d) Power

16) _____ is process, which makes it possible to selectively remove the deposited films or parts of the substrate in order to obtain desired patterns.
a) Etching b) Implantation c) Doping d) Evaporation

17) In _____ strain gages, change resistance in response to a mechanical strain.
a) Piezo-electric b) RTD
c) Piezo-resistive d) None of the above

18) For precise measurement, strain gauge must have the following properties
a) High gauge factor b) Low temperature coefficient
c) High resistance d) All of the above

19) A _____ actuator uses a pressurized air to drive a piston.
a) Hydraulic b) Pneumatic
c) Electric d) None of the above

20) _____ is a device that converts energy to mechanical motion.
a) Sensors b) Actuators c) Transducers d) Amplifiers

_____

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Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MECHATRONICS (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 ***wherever*** *necessary.*

SECTION – I

2. Attempt **any four** : **(5×4=20)**
   a) Differentiate the open loop and closed loop control system.
   b) Explain the factors considered for the selection of a PLC.
   c) What are the limitations of a two step on-off control and in what situation is such a control system commonly used ?
   d) Explain a four quadrant DC drive with neat diagram and waveforms. Estimate different specifications.
   e) Explain in detail the Functional Block Diagram (FBD) programming of a PLC.

3. Attempt **any two** : **(10×2=20)**
   a) Draw and explain the ladder diagram and the equivalent PLC instruction and truth table of NAND, NOR, XOR, and XNOR gates.
   b) Explain in detail different methods used to program PLC's with examples.
   c) Derive a mathematical model for PD controller. Explain electronic Proportional Derivative (PD) controller with necessary circuit diagrams.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   a) What is piezo-resistivity ? Explain the working of an accelerometer that uses piezo-resistivity.
   b) Draw and explain block diagram of typical MEMS system.

c) Compare hydraulic and pneumatic actuation systems with examples.
d) What is etching ? Explain in detail dry etching process.
e) What is impurity doping ? Explain diffusion doping of semiconductors.

5. Attempt **any two** : **(10×2=20)**

a) What are the differences between traditional and mechatronics designs ? Explain in detail with examples.
b) Explain the working principle of hydraulic actuation system with a neat sketch.
c) Explain in detail LIGA fabrication process for MEMS devices.

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Seat No.	

Set **R**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MECHATRONICS (Elective – I)

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

3) ***All*** *questions are* ***compulsory****.*

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

5) Assume suitable data ***wherever*** *necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) _____ is process, which makes it possible to selectively remove the deposited films or parts of the substrate in order to obtain desired patterns.
a) Etching b) Implantation c) Doping d) Evaporation

2) In _____ strain gages, change resistance in response to a mechanical strain.
a) Piezo-electric b) RTD
c) Piezo-resistive d) None of the above

3) For precise measurement, strain gauge must have the following properties
a) High gauge factor b) Low temperature coefficient
c) High resistance d) All of the above

4) A _____ actuator uses a pressurized air to drive a piston.
a) Hydraulic b) Pneumatic
c) Electric d) None of the above

5) _____ is a device that converts energy to mechanical motion.
a) Sensors b) Actuators c) Transducers d) Amplifiers

6) The device which provides maximum isolation is
a) Opto-isolator b) Pulse transformer
c) Normal transformer d) None of the above

7) Closed loop control systems are
i) More stable than open loop systems
ii) More complex to design than open loop systems.
a) Both i and ii are true b) i is true and ii is false
c) i is false and ii is true d) Both i and ii are false

8) In PID controller _____ parameter is responsible for oscillation.
a) KP b) PO c) KD d) KI

9) The variable frequency drive is suitable for _____ motor.
a) DC servo b) DC series c) AC d) DC shunt

10) The advantages of using the relay type output in PLC's is that
a) They allows small currents to switch large currents
b) Provides isolation to the PLC from external circuit
c) Suitable for both AC and DC switching
d) All of the above

11) In a temperature control system, what represents the output of the system
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c) The heat produced by the system
d) The heating element

12) The term PLC stands for
a) Personal Logic Computer b) Programmable Logic Computer
c) Personal Logic Controller d) Programmable Logic Controller

13) _____ is a PLC function capable of storing and shifting binary data.
a) Timer b) Shift register c) Counter d) Relay

14) With integral control, the controller output is,
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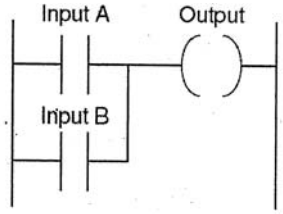
ii) Increases at a constant rate when the error is constant
a) Both i and ii are true b) i is true and ii is false
c) i is false and ii is true d) Both i and ii are false

15) The number of I/O's for micro PLC are
a) More than 8 b) Less than 4 c) More than 16 d) More than 32

16) The ladder diagram shown below is for _____ gate.



a) AND b) NOR c) OR d) NAND

17) Different sensors are interfaced with _____ card of the PLC.
a) Memory b) Input c) Output d) Power

18) The resolution of an analogue to digital converter with a word length of 10 bits and an analogue signal input range of 10 V is
a) 9.76 mV b) 256 mV c) 1.25 mV d) 5V

19) The basic element of ON/OFF controller is
a) Amplifier b) Comparator
c) Oscillator d) Differential amplifier

20) Actuators are interfaced with _____ card of the PLC.
a) Memory b) Input c) Output d) Power

_____

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Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MECHATRONICS (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 ***wherever*** *necessary.*

SECTION – I

2. Attempt **any four** : **(5×4=20)**
   a) Differentiate the open loop and closed loop control system.
   b) Explain the factors considered for the selection of a PLC.
   c) What are the limitations of a two step on-off control and in what situation is such a control system commonly used ?
   d) Explain a four quadrant DC drive with neat diagram and waveforms. Estimate different specifications.
   e) Explain in detail the Functional Block Diagram (FBD) programming of a PLC.

3. Attempt **any two** : **(10×2=20)**
   a) Draw and explain the ladder diagram and the equivalent PLC instruction and truth table of NAND, NOR, XOR, and XNOR gates.
   b) Explain in detail different methods used to program PLC's with examples.
   c) Derive a mathematical model for PD controller. Explain electronic Proportional Derivative (PD) controller with necessary circuit diagrams.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   a) What is piezo-resistivity ? Explain the working of an accelerometer that uses piezo-resistivity.
   b) Draw and explain block diagram of typical MEMS system.

c) Compare hydraulic and pneumatic actuation systems with examples.
d) What is etching ? Explain in detail dry etching process.
e) What is impurity doping ? Explain diffusion doping of semiconductors.

5. Attempt **any two** : **(10×2=20)**

a) What are the differences between traditional and mechatronics designs ? Explain in detail with examples.
b) Explain the working principle of hydraulic actuation system with a neat sketch.
c) Explain in detail LIGA fabrication process for MEMS devices.

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Seat No.	

Set **S**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MECHATRONICS (Elective – I)

Day and Date : Tuesday, 9-5-2017 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

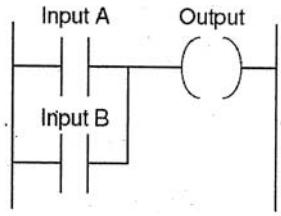
Instructions *: 1) Q. No.* ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
2) ***Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) The ladder diagram shown below is for _____ gate.



a) AND b) NOR c) OR d) NAND

2) Different sensors are interfaced with _____ card of the PLC.
a) Memory b) Input c) Output d) Power

3) The resolution of an analogue to digital converter with a word length of 10 bits and an analogue signal input range of 10 V is
a) 9.76 mV b) 256 mV c) 1.25 mV d) 5V

4) The basic element of ON/OFF controller is
a) Amplifier b) Comparator
c) Oscillator d) Differential amplifier

5) Actuators are interfaced with _____ card of the PLC.
a) Memory b) Input c) Output d) Power

6) _____ is process, which makes it possible to selectively remove the deposited films or parts of the substrate in order to obtain desired patterns.
a) Etching b) Implantation c) Doping d) Evaporation

7) In _____ strain gages, change resistance in response to a mechanical strain.
a) Piezo-electric b) RTD
c) Piezo-resistive d) None of the above

8) For precise measurement, strain gauge must have the following properties
   a) High gauge factor b) Low temperature coefficient
   c) High resistance d) All of the above
9) A _____ actuator uses a pressurized air to drive a piston.
   a) Hydraulic b) Pneumatic
   c) Electric d) None of the above
10) _____ is a device that converts energy to mechanical motion.
   a) Sensors b) Actuators c) Transducers d) Amplifiers
11) The device which provides maximum isolation is
   a) Opto-isolator b) Pulse transformer
   c) Normal transformer d) None of the above
12) Closed loop control systems are
   i) More stable than open loop systems
   ii) More complex to design than open loop systems.
   a) Both i and ii are true b) i is true and ii is false
   c) i is false and ii is true d) Both i and ii are false
13) In PID controller _____ parameter is responsible for oscillation.
   a) KP b) PO c) KD d) KI
14) The variable frequency drive is suitable for _____ motor.
   a) DC servo b) DC series c) AC d) DC shunt
15) The advantages of using the relay type output in PLC's is that
   a) They allows small currents to switch large currents
   b) Provides isolation to the PLC from external circuit
   c) Suitable for both AC and DC switching
   d) All of the above
16) In a temperature control system, what represents the output of the system
   a) The required temperature
   b) The actual temperature achieved
   c) The heat produced by the system
   d) The heating element
17) The term PLC stands for
   a) Personal Logic Computer b) Programmable Logic Computer
   c) Personal Logic Controller d) Programmable Logic Controller
18) _____ is a PLC function capable of storing and shifting binary data.
   a) Timer b) Shift register c) Counter d) Relay
19) With integral control, the controller output is,
   i) Zero when the error changes at a constant rate
   ii) Increases at a constant rate when the error is constant
   a) Both i and ii are true b) i is true and ii is false
   c) i is false and ii is true d) Both i and ii are false
20) The number of I/O's for micro PLC are
   a) More than 8 b) Less than 4 c) More than 16 d) More than 32

_____

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Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
MECHATRONICS (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 ***wherever*** *necessary.*

SECTION – I

2. Attempt **any four** : **(5×4=20)**
   a) Differentiate the open loop and closed loop control system.
   b) Explain the factors considered for the selection of a PLC.
   c) What are the limitations of a two step on-off control and in what situation is such a control system commonly used ?
   d) Explain a four quadrant DC drive with neat diagram and waveforms. Estimate different specifications.
   e) Explain in detail the Functional Block Diagram (FBD) programming of a PLC.

3. Attempt **any two** : **(10×2=20)**
   a) Draw and explain the ladder diagram and the equivalent PLC instruction and truth table of NAND, NOR, XOR, and XNOR gates.
   b) Explain in detail different methods used to program PLC's with examples.
   c) Derive a mathematical model for PD controller. Explain electronic Proportional Derivative (PD) controller with necessary circuit diagrams.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   a) What is piezo-resistivity ? Explain the working of an accelerometer that uses piezo-resistivity.
   b) Draw and explain block diagram of typical MEMS system.

c) Compare hydraulic and pneumatic actuation systems with examples.
d) What is etching ? Explain in detail dry etching process.
e) What is impurity doping ? Explain diffusion doping of semiconductors.

5. Attempt **any two** : **(10×2=20)**

a) What are the differences between traditional and mechatronics designs ? Explain in detail with examples.
b) Explain the working principle of hydraulic actuation system with a neat sketch.
c) Explain in detail LIGA fabrication process for MEMS devices.

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Seat No.	

Set **P**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
Elective – I : IMAGE PROCESSING

Day and Date : Tuesday, 9-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicates* ***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 answer : **20**

1) What is image ?
   a) Picture b) Matrix of pixel
   c) Collection of pixel d) All of these

2) First application of digital image was in the
   a) Newspaper industry b) communication system
   c) a) and b) d) None of these

3) The principle energy source for images
   a) electrical spectrum b) magnetic spectrum
   c) electro spectrum d) electromagnetic spectrum

4) Image enhancement and restoration are used to process
   a) high resolution images b) degraded images
   c) high quality images d) brighter images

5) Gradient computation equation is
   a) $|Gx| + |Gy|$ b) $|Gx| - |Gy|$ c) $|Gx|/|Gy|$ d) $|Gx| \times |Gy|$

6) Second derivative approximation says that values along the ramp must be
   a) non-zero b) zero c) positive d) negative

7) One that is not a method of image segmentation is
   a) area b) line c) point d) edge

P.T.O.

8) Discontinuity approach of segmentation depends upon
   a) low frequencies b) smooth changes
   c) abrupt changes d) contrast
9) Two regions are said to be adjacent if their union forms
   a) connected set b) boundaries
   c) region d) image
10) Example of similarity approach in image segmentation is
   a) edge based segmentation b) boundary based segmentation
   c) region based segmentation d) Both a) and b)
11) Process of manipulating the digital image to make results more suitable is called
   a) manipulation b) improvement c) enhancement d) degradation
12) High pass filters are used for image
   a) contrast b) sharpening c) blurring d) resizing
13) In the formula g(x, y) = T[f(x, y)], T is the
   a) transformed image b) transformation vector
   c) transformation theorem d) transformation function
14) Gamma correction is mostly used in
   a) CRT devices b) audio devices c) radio d) turbines
15) Thresholding function in contrast stretching creates
   a) binary image b) high quality image
   c) enhanced image d) low quality image
16) Log transformation is given by the formula
   a) s = clog(r) b) s = clog(1 + r) c) s = clog(2 + r) d) s = log(1 + r)
17) Process involved in linear spatial filtering is
   a) correlation b) convolution
   c) histogram equalization d) both a) and b)
18) _____ represent an object boundary by a connected sequence of straight line segments of specified length and direction.
   a) hex codes b) chain codes c) binary codes d) none of above
19) _____ view a coordinate (x, y) as a complex number (x = real part and y = imaginary part) then apply the Fourier transform to a sequence of boundary points.
   a) Fourier descriptor b) Laplace descriptor
   c) Regional descriptor d) None
20) In geometric mean filters when alpha is equal to 0 then it works as
   a) notch filter b) bandpass filter
   c) parametric wiener filter d) inverse filter

SLR-VB – 155

Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
Elective – I : IMAGE 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** indicates **full** marks.*
*3) Assume suitable data **if necessary**.*

SECTION – I

2. Attempt **any four** : **(4×6=24)**

a) Write short notes on sampling and quantization.

b) Explain the basic relationships between pixels.

c) Explain Fast Fourier Transform (FFT) in detail.

d) Discuss the image smoothing filter with its model in the spatial domain.

e) Explain contrast stretching and masking.

3. Solve **any two** : **(2×8=16)**

a) Explain DCT and its properties.

b) Compare the basic frequency domain filters :

i) Ideal low pass

ii) Butterworth pass

iii) Gaussian low pass.

c) What is image restoration ? Explain the degradation model for continuous function in detail.

SECTION – II

4. Attempt **any four** : **(4×6=24)**

   a) What is the advantage of sobel operator over prewitt operator ?

   b) Explain region based segmentation.

   c) What is polygon approximation ?

   d) Explain different compression methods.

   e) Write a note on signatures and skeletons.

5. Attempt **any two** : **(2×8=16)**

   a) What is global threshold for segmentation ? Give algorithm for obtaining threshold value.

   b) What is the advantage to use relational descriptors ? Describe the process of description using relational descriptors.

   c) Explain JPEG compression and decompression.

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SLR-VB – 155

Seat No.	

Set **Q**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
Elective – I : IMAGE PROCESSING

Day and Date : Tuesday, 9-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicates* ***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 answer : **20**

1) Log transformation is given by the formula
   a) s = clog(r) b) s = clog(1 + r) c) s = clog(2 + r) d) s = log(1 + r)

2) Process involved in linear spatial filtering is
   a) correlation b) convolution
   c) histogram equalization d) both a) and b)

3) _____ represent an object boundary by a connected sequence of straight line segments of specified length and direction.
   a) hex codes b) chain codes c) binary codes d) none of above

4) _____ view a coordinate (x, y) as a complex number (x = real part and y = imaginary part) then apply the Fourier transform to a sequence of boundary points.
   a) Fourier descriptor b) Laplace descriptor
   c) Regional descriptor d) None

5) In geometric mean filters when alpha is equal to 0 then it works as
   a) notch filter b) bandpass filter
   c) parametric wiener filter d) inverse filter

6) What is image ?
   a) Picture b) Matrix of pixel
   c) Collection of pixel d) All of these

P.T.O.

7) First application of digital image was in the
   a) Newspaper industry b) communication system
   c) a) and b) d) None of these
8) The principle energy source for images
   a) electrical spectrum b) magnetic spectrum
   c) electro spectrum d) electromagnetic spectrum
9) Image enhancement and restoration are used to process
   a) high resolution images b) degraded images
   c) high quality images d) brighter images
10) Gradient computation equation is
   a) $|Gx| + |Gy|$ b) $|Gx| - |Gy|$ c) $|Gx|/|Gy|$ d) $|Gx| \times |Gy|$
11) Second derivative approximation says that values along the ramp must be
   a) non-zero b) zero c) positive d) negative
12) One that is not a method of image segmentation is
   a) area b) line c) point d) edge
13) Discontinuity approach of segmentation depends upon
   a) low frequencies b) smooth changes
   c) abrupt changes d) contrast
14) Two regions are said to be adjacent if their union forms
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   c) region d) image
15) Example of similarity approach in image segmentation is
   a) edge based segmentation b) boundary based segmentation
   c) region based segmentation d) Both a) and b)
16) Process of manipulating the digital image to make results more suitable is called
   a) manipulation b) improvement c) enhancement d) degradation
17) High pass filters are used for image
   a) contrast b) sharpening c) blurring d) resizing
18) In the formula $g(x, y) = T[f(x, y)]$, T is the
   a) transformed image b) transformation vector
   c) transformation theorem d) transformation function
19) Gamma correction is mostly used in
   a) CRT devices b) audio devices c) radio d) turbines
20) Thresholding function in contrast stretching creates
   a) binary image b) high quality image
   c) enhanced image d) low quality image

SLR-VB – 155

Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
Elective – I : IMAGE 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** indicates **full** marks.*
*3) Assume suitable data **if necessary**.*

SECTION – I

2. Attempt **any four** : **(4×6=24)**

a) Write short notes on sampling and quantization.

b) Explain the basic relationships between pixels.

c) Explain Fast Fourier Transform (FFT) in detail.

d) Discuss the image smoothing filter with its model in the spatial domain.

e) Explain contrast stretching and masking.

3. Solve **any two** : **(2×8=16)**

a) Explain DCT and its properties.

b) Compare the basic frequency domain filters :

i) Ideal low pass

ii) Butterworth pass

iii) Gaussian low pass.

c) What is image restoration ? Explain the degradation model for continuous function in detail.

SECTION – II

4. Attempt **any four** : **(4×6=24)**

   a) What is the advantage of sobel operator over prewitt operator ?

   b) Explain region based segmentation.

   c) What is polygon approximation ?

   d) Explain different compression methods.

   e) Write a note on signatures and skeletons.

5. Attempt **any two** : **(2×8=16)**

   a) What is global threshold for segmentation ? Give algorithm for obtaining threshold value.

   b) What is the advantage to use relational descriptors ? Describe the process of description using relational descriptors.

   c) Explain JPEG compression and decompression.

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Seat No.	

Set **R**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
Elective – I : IMAGE PROCESSING

Day and Date : Tuesday, 9-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicates* ***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 answer : **20**

1) Process of manipulating the digital image to make results more suitable is called
a) manipulation b) improvement c) enhancement d) degradation

2) High pass filters are used for image
a) contrast b) sharpening c) blurring d) resizing

3) In the formula g(x, y) = T[f(x, y)], T is the
a) transformed image b) transformation vector
c) transformation theorem d) transformation function

4) Gamma correction is mostly used in
a) CRT devices b) audio devices c) radio d) turbines

5) Thresholding function in contrast stretching creates
a) binary image b) high quality image
c) enhanced image d) low quality image

6) Log transformation is given by the formula
a) s = clog(r) b) s = clog(1 + r) c) s = clog(2 + r) d) s = log(1 + r)

7) Process involved in linear spatial filtering is
a) correlation b) convolution
c) histogram equalization d) both a) and b)

P.T.O.

8) _____ represent an object boundary by a connected sequence of straight line segments of specified length and direction.
   a) hex codes b) chain codes c) binary codes d) none of above

9) _____ view a coordinate (x, y) as a complex number (x = real part and y = imaginary part) then apply the Fourier transform to a sequence of boundary points.
   a) Fourier descriptor b) Laplace descriptor
   c) Regional descriptor d) None

10) In geometric mean filters when alpha is equal to 0 then it works as
   a) notch filter b) bandpass filter
   c) parametric wiener filter d) inverse filter

11) What is image ?
   a) Picture b) Matrix of pixel
   c) Collection of pixel d) All of these

12) First application of digital image was in the
   a) Newspaper industry b) communication system
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13) The principle energy source for images
   a) electrical spectrum b) magnetic spectrum
   c) electro spectrum d) electromagnetic spectrum

14) Image enhancement and restoration are used to process
   a) high resolution images b) degraded images
   c) high quality images d) brighter images

15) Gradient computation equation is
   a) $|Gx| + |Gy|$ b) $|Gx| - |Gy|$ c) $|Gx|/|Gy|$ d) $|Gx| \times |Gy|$

16) Second derivative approximation says that values along the ramp must be
   a) non-zero b) zero c) positive d) negative

17) One that is not a method of image segmentation is
   a) area b) line c) point d) edge

18) Discontinuity approach of segmentation depends upon
   a) low frequencies b) smooth changes
   c) abrupt changes d) contrast

19) Two regions are said to be adjacent if their union forms
   a) connected set b) boundaries
   c) region d) image

20) Example of similarity approach in image segmentation is
   a) edge based segmentation b) boundary based segmentation
   c) region based segmentation d) Both a) and b)

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Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
Elective – I : IMAGE 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** indicates **full** marks.*
*3) Assume suitable data **if necessary**.*

SECTION – I

2. Attempt **any four** : **(4×6=24)**

a) Write short notes on sampling and quantization.

b) Explain the basic relationships between pixels.

c) Explain Fast Fourier Transform (FFT) in detail.

d) Discuss the image smoothing filter with its model in the spatial domain.

e) Explain contrast stretching and masking.

3. Solve **any two** : **(2×8=16)**

a) Explain DCT and its properties.

b) Compare the basic frequency domain filters :

i) Ideal low pass

ii) Butterworth pass

iii) Gaussian low pass.

c) What is image restoration ? Explain the degradation model for continuous function in detail.

SECTION – II

4. Attempt **any four** : **(4×6=24)**

   a) What is the advantage of sobel operator over prewitt operator ?

   b) Explain region based segmentation.

   c) What is polygon approximation ?

   d) Explain different compression methods.

   e) Write a note on signatures and skeletons.

5. Attempt **any two** : **(2×8=16)**

   a) What is global threshold for segmentation ? Give algorithm for obtaining threshold value.

   b) What is the advantage to use relational descriptors ? Describe the process of description using relational descriptors.

   c) Explain JPEG compression and decompression.

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Seat No.	

Set **S**

B.E. (Electronics Engineering) (Part – I) Examination, 2017
Elective – I : IMAGE PROCESSING

Day and Date : Tuesday, 9-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicates* ***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 answer : **20**

1) Second derivative approximation says that values along the ramp must be
a) non-zero b) zero c) positive d) negative

2) One that is not a method of image segmentation is
a) area b) line c) point d) edge

3) Discontinuity approach of segmentation depends upon
a) low frequencies b) smooth changes
c) abrupt changes d) contrast

4) Two regions are said to be adjacent if their union forms
a) connected set b) boundaries
c) region d) image

5) Example of similarity approach in image segmentation is
a) edge based segmentation b) boundary based segmentation
c) region based segmentation d) Both a) and b)

6) Process of manipulating the digital image to make results more suitable is called
a) manipulation b) improvement c) enhancement d) degradation

7) High pass filters are used for image
a) contrast b) sharpening c) blurring d) resizing

P.T.O.

8) In the formula g(x, y) = T[f(x, y)], T is the
   a) transformed image b) transformation vector
   c) transformation theorem d) transformation function

9) Gamma correction is mostly used in
   a) CRT devices b) audio devices c) radio d) turbines

10) Thresholding function in contrast stretching creates
   a) binary image b) high quality image
   c) enhanced image d) low quality image

11) Log transformation is given by the formula
   a) s = clog(r) b) s = clog(1 + r) c) s = clog(2 + r) d) s = log(1 + r)

12) Process involved in linear spatial filtering is
   a) correlation b) convolution
   c) histogram equalization d) both a) and b)

13) _____ represent an object boundary by a connected sequence of straight line segments of specified length and direction.
   a) hex codes b) chain codes c) binary codes d) none of above

14) _____ view a coordinate (x, y) as a complex number (x = real part and y = imaginary part) then apply the Fourier transform to a sequence of boundary points.
   a) Fourier descriptor b) Laplace descriptor
   c) Regional descriptor d) None

15) In geometric mean filters when alpha is equal to 0 then it works as
   a) notch filter b) bandpass filter
   c) parametric wiener filter d) inverse filter

16) What is image ?
   a) Picture b) Matrix of pixel
   c) Collection of pixel d) All of these

17) First application of digital image was in the
   a) Newspaper industry b) communication system
   c) a) and b) d) None of these

18) The principle energy source for images
   a) electrical spectrum b) magnetic spectrum
   c) electro spectrum d) electromagnetic spectrum

19) Image enhancement and restoration are used to process
   a) high resolution images b) degraded images
   c) high quality images d) brighter images

20) Gradient computation equation is
   a) |Gx| + |Gy| b) |Gx| – |Gy| c) |Gx|/|Gy| d) |Gx| × |Gy|

SLR-VB – 155

Seat No.	

B.E. (Electronics Engineering) (Part – I) Examination, 2017
Elective – I : IMAGE 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** indicates **full** marks.*
*3) Assume suitable data **if necessary**.*

SECTION – I

2. Attempt **any four** : **(4×6=24)**

a) Write short notes on sampling and quantization.

b) Explain the basic relationships between pixels.

c) Explain Fast Fourier Transform (FFT) in detail.

d) Discuss the image smoothing filter with its model in the spatial domain.

e) Explain contrast stretching and masking.

3. Solve **any two** : **(2×8=16)**

a) Explain DCT and its properties.

b) Compare the basic frequency domain filters :

i) Ideal low pass

ii) Butterworth pass

iii) Gaussian low pass.

c) What is image restoration ? Explain the degradation model for continuous function in detail.

SECTION – II

4. Attempt **any four** : **(4×6=24)**

   a) What is the advantage of sobel operator over prewitt operator ?

   b) Explain region based segmentation.

   c) What is polygon approximation ?

   d) Explain different compression methods.

   e) Write a note on signatures and skeletons.

5. Attempt **any two** : **(2×8=16)**

   a) What is global threshold for segmentation ? Give algorithm for obtaining threshold value.

   b) What is the advantage to use relational descriptors ? Describe the process of description using relational descriptors.

   c) Explain JPEG compression and decompression.

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Seat No.	

Set **P**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 16-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions:
1) ***All*** *questions are* ***compulsory****.*
2) *Figures to the* ***right*** *indicates* ***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 options : **20**

1) Microwave energies propagate the length of the waveguide by _____ its side walls.
   a) Refraction off b) Reflection off
   c) Moving off d) None of the above

2) TRAPATT diode is preferred over IMPATT diode because of
   a) High η
   b) Less sensitivity to harmonics
   c) Lower noise
   d) Ability to operate at higher frequencies

3) Two entities that are combined to form a Magic Tee are
   a) One H and two E plane tees b) One H and one E plane tees
   c) Two H and two plane tees d) Two H and one E plane tees

4) Which one of the following device behaviour is governed by bulk effect ?
   a) IMPATT diode b) Gunn diode c) Tunnel diode d) PIN diode

5) A frequency at which microwave ovens operate is
   a) 50 μ Hz b) 2.45 GHz c) 3.3 GHz d) 4.5 GHz

6) In the repeller space of a reflex klystron, the transit time must be $n + \frac{3}{4}$ cycle to ensure that
   a) It is equal to the period of the cavity oscillations
   b) The repeller is not damaged by striking electrons
   c) Returning electrons has given energy to the gap oscillations
   d) Electrons are accelerated by the gap voltage on their return

7) On which factor the maximum range of radar depends ?
   a) Pulse duration b) Pulse energy
   c) Pulse frequency d) None of the above

P.T.O.

8) In a MTI radar, the quartz delay line is used to
   a) Match the phase of COHO and output oscillator
   b) Match the phase of COHO and STALO
   c) Match the signal with echo
   d) Subtract a complete scan from previous scan

9) In a satellite when does the concept of Epigee and Perigee come into consideration ?
   a) When the satellite is in geostationary orbit
   b) When the satellite is in lower orbit
   c) When the satellite is in elliptical orbit
   d) When the satellite is in circular orbit

10) The type of modulation used in satellite communication is
   a) PWM b) PCM
   c) FM d) AM

11) The earth's shadow falls on a geostationary orbit for
   a) 30 days b) 31 days
   c) 365 days d) 88 days

12) "The square of the period of revolution to the planet about the sun is proportional to the cubes of their mean distances from the sun". This statement is based on
   a) Galileo's hypothesis b) Kepler's law
   c) Newton's law d) None of the above

13) Consider a satellite, where the radius of circular orbit is r. The orbital period of the satellite is proportional to
   a) r b) r^2 c) r^3 d) $r^{3/2}$

14) A communication satellite is a repeater between
   a) Many transmitting stations and many receiving stations
   b) One transmitting stations and many receiving stations
   c) One transmitting stations and one receiving stations
   d) Many transmitting stations and one receiving stations

15) A satellite in low circular orbit than a geostationary orbit is known as
   a) Passive satellite b) Slow moving satellite
   c) Fast moving satellite d) Active satellite

16) Collection of data from different sensors and sending them to earth station is done by
   a) Telemetry b) Tracking
   c) Frequency translator d) Propulsion sub-system

17) Which system is used in tracking ?
   a) Rectangular system b) Triangular system
   c) Elliptical system d) None

18) _____ is one of the most important element in an optical fiber link.
   a) Cabled fiber b) Optical amplifiers
   c) Photo-detectors d) Light sources

19) One of the principal characteristics of an optical fiber is _____ as a function of wavelength.
   a) Transmission b) Communication
   c) Attenuation d) Amplification

20) The technology of combining a number of wavelength on to the same fiber is known as
   a) EDFA b) ISDN
   c) ATM d) WDM

_____

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Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 16-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any three** : **(3×8=24)**
   a) Derive S-matrix for EH plane tee. Explain some of its application.
   b) Describe in detail the principles of the following terms Gunn Effect, high field domain, two valley theory and three valley theory.
   c) Derive the radar range equation. Write radar performance factors.
   d) Illustrate principle operation of Tunnel diode and list its applications.

3. Attempt **any four** : **(4×4=16)**
   a) What are the advantages of microwave frequencies over low frequency ?
   b) Explain the function of circulator.
   c) Derive the voltage and current refection coefficient.
   d) Discuss waveguide.
   e) Compare CW Doppler radar and FM-CW radar.

SECTION – II

4. Attempt **any three** : **(3×8=24)**
   a) Explain in detail Attitude and Orbit Control System (AOCS) and power subsystem.
   b) Draw the block diagram of earth station and explain in detail.
   c) Realize construction and working of edge emitting double hertojuncation LED.
   d) Write a note on satellite radio broadcasting and antennas used in satellite communication.

5. Attempt **any four** : **(4×4=16)**
   a) What is meant by geostationary satellite ?
   b) Explain in detail orbital effects in communication system performance.
   c) Explain in detail launch and launch vehicles.
   d) Classify optical fiber.
   e) Derive numerical aperture for step index fiber.

Set P

Set P

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Seat No.	

Set **Q**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 16-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions:
1) ***All*** *questions are* ***compulsory****.*
2) *Figures to the* ***right*** *indicates* ***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 options : **20**

1) Collection of data from different sensors and sending them to earth station is done by
   a) Telemetry b) Tracking
   c) Frequency translator d) Propulsion sub-system

2) Which system is used in tracking ?
   a) Rectangular system b) Triangular system
   c) Elliptical system d) None

3) _____ is one of the most important element in an optical fiber link.
   a) Cabled fiber b) Optical amplifiers
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4) One of the principal characteristics of an optical fiber is _____ as a function of wavelength.
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6) Microwave energies propagate the length of the waveguide by _____ its side walls.
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   a) High η
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   a) One H and two E plane tees b) One H and one E plane tees
   c) Two H and two plane tees d) Two H and one E plane tees

P.T.O.

9) Which one of the following device behaviour is governed by bulk effect ?
   a) IMPATT diode b) Gunn diode c) Tunnel diode d) PIN diode

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   a) 50 μ Hz b) 2.45 GHz c) 3.3 GHz d) 4.5 GHz

11) In the repeller space of a reflex klystron, the transit time must be $n + \frac{3}{4}$ cycle to ensure that
   a) It is equal to the period of the cavity oscillations
   b) The repeller is not damaged by striking electrons
   c) Returning electrons has given energy to the gap oscillations
   d) Electrons are accelerated by the gap voltage on their return

12) On which factor the maximum range of radar depends ?
   a) Pulse duration b) Pulse energy
   c) Pulse frequency d) None of the above

13) In a MTI radar, the quartz delay line is used to
   a) Match the phase of COHO and output oscillator
   b) Match the phase of COHO and STALO
   c) Match the signal with echo
   d) Subtract a complete scan from previous scan

14) In a satellite when does the concept of Epigee and Perigee come into consideration ?
   a) When the satellite is in geostationary orbit
   b) When the satellite is in lower orbit
   c) When the satellite is in elliptical orbit
   d) When the satellite is in circular orbit

15) The type of modulation used in satellite communication is
   a) PWM b) PCM
   c) FM d) AM

16) The earth's shadow falls on a geostationary orbit for
   a) 30 days b) 31 days
   c) 365 days d) 88 days

17) "The square of the period of revolution to the planet about the sun is proportional to the cubes of their mean distances from the sun". This statement is based on
   a) Galileo's hypothesis b) Kepler's law
   c) Newton's law d) None of the above

18) Consider a satellite, where the radius of circular orbit is r. The orbital period of the satellite is proportional to
   a) r b) r^2 c) r^3 d) $r^{3/2}$

19) A communication satellite is a repeater between
   a) Many transmitting stations and many receiving stations
   b) One transmitting stations and many receiving stations
   c) One transmitting stations and one receiving stations
   d) Many transmitting stations and one receiving stations

20) A satellite in low circular orbit than a geostationary orbit is known as
   a) Passive satellite b) Slow moving satellite
   c) Fast moving satellite d) Active satellite

SLR-VB – 156

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 16-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any three** : **(3×8=24)**
   a) Derive S-matrix for EH plane tee. Explain some of its application.
   b) Describe in detail the principles of the following terms Gunn Effect, high field domain, two valley theory and three valley theory.
   c) Derive the radar range equation. Write radar performance factors.
   d) Illustrate principle operation of Tunnel diode and list its applications.

3. Attempt **any four** : **(4×4=16)**
   a) What are the advantages of microwave frequencies over low frequency ?
   b) Explain the function of circulator.
   c) Derive the voltage and current refection coefficient.
   d) Discuss waveguide.
   e) Compare CW Doppler radar and FM-CW radar.

SECTION – II

4. Attempt **any three** : **(3×8=24)**
   a) Explain in detail Attitude and Orbit Control System (AOCS) and power subsystem.
   b) Draw the block diagram of earth station and explain in detail.
   c) Realize construction and working of edge emitting double hertojuncation LED.
   d) Write a note on satellite radio broadcasting and antennas used in satellite communication.

5. Attempt **any four** : **(4×4=16)**
   a) What is meant by geostationary satellite ?
   b) Explain in detail orbital effects in communication system performance.
   c) Explain in detail launch and launch vehicles.
   d) Classify optical fiber.
   e) Derive numerical aperture for step index fiber.

Set Q

Set Q

SLR-VB – 156

Seat No.	

Set **R**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 16-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions:
1) ***All*** *questions are* ***compulsory****.*
2) *Figures to the* ***right*** *indicates* ***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 options : **20**

1) The earth's shadow falls on a geostationary orbit for
   a) 30 days b) 31 days
   c) 365 days d) 88 days

2) "The square of the period of revolution to the planet about the sun is proportional to the cubes of their mean distances from the sun". This statement is based on
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3) Consider a satellite, where the radius of circular orbit is r. The orbital period of the satellite is proportional to
   a) r b) r^2
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   a) Many transmitting stations and many receiving stations
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   c) One transmitting stations and one receiving stations
   d) Many transmitting stations and one receiving stations

5) A satellite in low circular orbit than a geostationary orbit is known as
   a) Passive satellite b) Slow moving satellite
   c) Fast moving satellite d) Active satellite

6) Collection of data from different sensors and sending them to earth station is done by
   a) Telemetry b) Tracking
   c) Frequency translator d) Propulsion sub-system

7) Which system is used in tracking ?
   a) Rectangular system b) Triangular system
   c) Elliptical system d) None

8) _____ is one of the most important element in an optical fiber link.
   a) Cabled fiber b) Optical amplifiers
   c) Photo-detectors d) Light sources

P.T.O.

9) One of the principal characteristics of an optical fiber is _____ as a function of wavelength.
   a) Transmission b) Communication
   c) Attenuation d) Amplification

10) The technology of combining a number of wavelength on to the same fiber is known as
   a) EDFA b) ISDN
   c) ATM d) WDM

11) Microwave energies propagate the length of the waveguide by _____ its side walls.
   a) Refraction off b) Reflection off
   c) Moving off d) None of the above

12) TRAPATT diode is preferred over IMPATT diode because of
   a) High η
   b) Less sensitivity to harmonics
   c) Lower noise
   d) Ability to operate at higher frequencies

13) Two entities that are combined to form a Magic Tee are
   a) One H and two E plane tees b) One H and one E plane tees
   c) Two H and two plane tees d) Two H and one E plane tees

14) Which one of the following device behaviour is governed by bulk effect ?
   a) IMPATT diode b) Gunn diode c) Tunnel diode d) PIN diode

15) A frequency at which microwave ovens operate is
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SLR-VB – 156

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 16-5-2017 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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   a) Derive S-matrix for EH plane tee. Explain some of its application.
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SECTION – II

4. Attempt **any three** : **(3×8=24)**
   a) Explain in detail Attitude and Orbit Control System (AOCS) and power subsystem.
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5. Attempt **any four** : **(4×4=16)**
   a) What is meant by geostationary satellite ?
   b) Explain in detail orbital effects in communication system performance.
   c) Explain in detail launch and launch vehicles.
   d) Classify optical fiber.
   e) Derive numerical aperture for step index fiber.

Set R

Set R

SLR-VB – 156

Seat No.	

Set **S**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 16-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct options : **20**

1) In the repeller space of a reflex klystron, the transit time must be $n + \frac{3}{4}$ cycle to ensure that
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P.T.O.

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   b) Less sensitivity to harmonics
   c) Lower noise
   d) Ability to operate at higher frequencies

18) Two entities that are combined to form a Magic Tee are
   a) One H and two E plane tees b) One H and one E plane tees
   c) Two H and two plane tees d) Two H and one E plane tees

19) Which one of the following device behaviour is governed by bulk effect ?
   a) IMPATT diode b) Gunn diode c) Tunnel diode d) PIN diode

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   a) 50 μ Hz b) 2.45 GHz c) 3.3 GHz d) 4.5 GHz

SLR-VB – 156

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 16-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any three** : **(3×8=24)**
   a) Derive S-matrix for EH plane tee. Explain some of its application.
   b) Describe in detail the principles of the following terms Gunn Effect, high field domain, two valley theory and three valley theory.
   c) Derive the radar range equation. Write radar performance factors.
   d) Illustrate principle operation of Tunnel diode and list its applications.

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   a) What are the advantages of microwave frequencies over low frequency ?
   b) Explain the function of circulator.
   c) Derive the voltage and current refection coefficient.
   d) Discuss waveguide.
   e) Compare CW Doppler radar and FM-CW radar.

SECTION – II

4. Attempt **any three** : **(3×8=24)**
   a) Explain in detail Attitude and Orbit Control System (AOCS) and power subsystem.
   b) Draw the block diagram of earth station and explain in detail.
   c) Realize construction and working of edge emitting double hertojuncation LED.
   d) Write a note on satellite radio broadcasting and antennas used in satellite communication.

5. Attempt **any four** : **(4×4=16)**
   a) What is meant by geostationary satellite ?
   b) Explain in detail orbital effects in communication system performance.
   c) Explain in detail launch and launch vehicles.
   d) Classify optical fiber.
   e) Derive numerical aperture for step index fiber.

Set S

Set S

SLR-VB – 157

Seat No.	

Set **P**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEMS

Day and Date : Thursday, 18-5-2017 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 necessary****.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) Raster images are also known as
a) Bitmap images b) Vector images
c) Clip art images d) Multimedia images

2) Joint Photographic Experts Group (JPEG) is used to compress
a) Music b) Pictures c) Images d) Frames

3) Moving Picture Experts Group (MPEG-2), was designed for high-quality DVD with a data rate of
a) 3 to 6 Mbps b) 4 to 6 Mbps c) 5 to 6 Mbps d) 6 to 6 Mbps

4) Convex surfaces may be used to
a) Absorb the sound b) Spread the sound
c) Concentrate the sound d) None of the above

5) Rooms vibrate and respond most readily to
a) Low frequencies b) High frequencies
c) Mid frequencies d) None of the above

6) In Audio and Video Compression, voice is sampled at 8000 samples per second with
a) 5 bits per sample b) 6 bits per sample
c) 7 bits per sample d) 8 bits per sample

7) In Real Time Interactive Audio Video, data are stored in the buffer at a possibly variable
a) Pixels b) Packets c) Rates d) Bytes

8) Graphic programs widely used in the graphic arts profession include _____
a) Desktop publishing programs, image editors and illustration programs
b) Artificial intelligence, virtual reality and illustration programs
c) Mega media programs, image editors and desktop publishing programs
d) Virtual reality, desktop publishing programs and illustration programs

P.T.O.

9) For speech, we need to compress the digitize signals at
a) 128 Khz b) 256 Khz c) 64 Khz d) 1152 Khz

10) In Joint Photographic Experts Group (JPEG), a gray scale picture is divided into blocks of
a) 5×5 pixels b) 6×6 pixels c) 7×7 pixels d) 8×8 pixels

11) The effect of producing too large displacement of the central beam in picture tube is known as
a) Comma effect b) Eddy effect
c) Pincushion effect d) Astigmatism effect

12) The signals U and V are
a) Same as I and Q
b) Modified I and Q
c) Same as colour difference components R-Y and B-Y
d) None of the above

13) The colour subcarrier oscillator frequency of NTSC receiver is _____
a) 5.579545 MHz b) 4.579545 MHz
c) 3.579545 MHz d) 2.579545 MHz

14) Colour burst is used in PAL to
a) Synchronize subcarrier phase
b) To identify the phase alternation line
c) Detect presence or absence of colour in the transmission
d) All of the above

15) _____ is the spectral purity of colour light.
a) Luminance b) Brightness c) Hue d) Saturation

16) Hue complementary to magenta is
a) Yellow b) Blue c) Cyan d) Green

17) The phase of the colour subcarrier burst signal in PAL system is along the axis at
a) $\pm180°$ b) $\pm45°$ c) $180\pm45°$ d) None

18) Delay line matrix is used in PAL receiver
a) To derive R, G and B colours
b) To separate the colour difference components
c) Cancel the phase errors
d) (b) and (c)

19) Which of the following technique is used for modulating video signal ?
a) Amplitude modulation b) Pulse code modulation
c) Picture modulation d) Frequency modulation

20) The process of bringing beam together in picture tube is known as
a) Convergence b) Purity c) Degaussing d) Pincushion

_____

SLR-VB – 157

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEMS

Day and Date : Thursday, 18-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) Define the term acoustics and state its requirement.
   2) Compare GIF and JPEG file formats.
   3) List the coding techniques used for audio-video systems.
   4) Explain lossy sequential DCT mode of JPEG.
   5) What is reverberation ? Give its significance in acoustics.

3. Attempt **any three** : **(3×8=24)**
   1) What is real time video ? How coding of real time video is carried out ?
   2) How sound is optically recorded on photographic film using variable density method ?
   3) Why is compression essential in multimedia applications ? Explain MPEG in detail.
   4) Draw the schematic of copier and explain in detail Xerox process.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Why the colour difference signal (G-Y) is not suitable for transmission ?
   2) How chrominance signal is derived from RGB signal in PAL TV system ?
   3) Show that interlaced scanning reduces flicker and conserves bandwidth.
   4) Compare SECAM and PAL TV standards.
   5) How interlaced error is measured ? Sketch line details of 1^{st} and 2^{nd} field.

5. Attempt **any three** : **(3×8=24)**
   1) Explain with neat diagram each block of NTSC coder.
   2) Explain trintron picture tube.
   3) Give elements of cable TV network. Explain block converter used in cable TV.
   4) With block diagram, explain in detail satellite TV system.

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SLR-VB – 157

Seat No.	

Set **Q**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEMS

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

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P.T.O.

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_____

SLR-VB – 157

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEMS

Day and Date : Thursday, 18-5-2017 Marks : 80
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SECTION – I

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   3) Show that interlaced scanning reduces flicker and conserves bandwidth.
   4) Compare SECAM and PAL TV standards.
   5) How interlaced error is measured ? Sketch line details of 1^{st} and 2^{nd} field.

Set Q

5. Attempt **any three** : **(3×8=24)**
   1) Explain with neat diagram each block of NTSC coder.
   2) Explain trintron picture tube.
   3) Give elements of cable TV network. Explain block converter used in cable TV.
   4) With block diagram, explain in detail satellite TV system.

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SLR-VB – 157

Seat No.	

Set **R**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEMS

Day and Date : Thursday, 18-5-2017 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 necessary****.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) The effect of producing too large displacement of the central beam in picture tube is known as
   a) Comma effect b) Eddy effect
   c) Pincushion effect d) Astigmatism effect

2) The signals U and V are
   a) Same as I and Q
   b) Modified I and Q
   c) Same as colour difference components R-Y and B-Y
   d) None of the above

3) The colour subcarrier oscillator frequency of NTSC receiver is _____
   a) 5.579545 MHz b) 4.579545 MHz
   c) 3.579545 MHz d) 2.579545 MHz

4) Colour burst is used in PAL to
   a) Synchronize subcarrier phase
   b) To identify the phase alternation line
   c) Detect presence or absence of colour in the transmission
   d) All of the above

5) _____ is the spectral purity of colour light.
   a) Luminance b) Brightness c) Hue d) Saturation

6) Hue complementary to magenta is
   a) Yellow b) Blue c) Cyan d) Green

7) The phase of the colour subcarrier burst signal in PAL system is along the axis at
   a) $\pm 180°$ b) $\pm 45°$ c) $180 \pm 45°$ d) None

P.T.O.

8) Delay line matrix is used in PAL receiver
   a) To derive R, G and B colours
   b) To separate the colour difference components
   c) Cancel the phase errors
   d) (b) and (c)

9) Which of the following technique is used for modulating video signal ?
   a) Amplitude modulation b) Pulse code modulation
   c) Picture modulation d) Frequency modulation

10) The process of bringing beam together in picture tube is known as
   a) Convergence b) Purity c) Degaussing d) Pincushion

11) Raster images are also known as
   a) Bitmap images b) Vector images
   c) Clip art images d) Multimedia images

12) Joint Photographic Experts Group (JPEG) is used to compress
   a) Music b) Pictures c) Images d) Frames

13) Moving Picture Experts Group (MPEG-2), was designed for high-quality DVD with a data rate of
   a) 3 to 6 Mbps b) 4 to 6 Mbps c) 5 to 6 Mbps d) 6 to 6 Mbps

14) Convex surfaces may be used to
   a) Absorb the sound b) Spread the sound
   c) Concentrate the sound d) None of the above

15) Rooms vibrate and respond most readily to
   a) Low frequencies b) High frequencies
   c) Mid frequencies d) None of the above

16) In Audio and Video Compression, voice is sampled at 8000 samples per second with
   a) 5 bits per sample b) 6 bits per sample
   c) 7 bits per sample d) 8 bits per sample

17) In Real Time Interactive Audio Video, data are stored in the buffer at a possibly variable
   a) Pixels b) Packets c) Rates d) Bytes

18) Graphic programs widely used in the graphic arts profession include _____
   a) Desktop publishing programs, image editors and illustration programs
   b) Artificial intelligence, virtual reality and illustration programs
   c) Mega media programs, image editors and desktop publishing programs
   d) Virtual reality, desktop publishing programs and illustration programs

19) For speech, we need to compress the digitize signals at
   a) 128 Khz b) 256 Khz c) 64 Khz d) 1152 Khz

20) In Joint Photographic Experts Group (JPEG), a gray scale picture is divided into blocks of
   a) 5×5 pixels b) 6×6 pixels c) 7×7 pixels d) 8×8 pixels

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SLR-VB – 157

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEMS

Day and Date : Thursday, 18-5-2017 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** : **(4×4=16)**
   1) Define the term acoustics and state its requirement.
   2) Compare GIF and JPEG file formats.
   3) List the coding techniques used for audio-video systems.
   4) Explain lossy sequential DCT mode of JPEG.
   5) What is reverberation ? Give its significance in acoustics.

3. Attempt **any three** : **(3×8=24)**
   1) What is real time video ? How coding of real time video is carried out ?
   2) How sound is optically recorded on photographic film using variable density method ?
   3) Why is compression essential in multimedia applications ? Explain MPEG in detail.
   4) Draw the schematic of copier and explain in detail Xerox process.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Why the colour difference signal (G-Y) is not suitable for transmission ?
   2) How chrominance signal is derived from RGB signal in PAL TV system ?
   3) Show that interlaced scanning reduces flicker and conserves bandwidth.
   4) Compare SECAM and PAL TV standards.
   5) How interlaced error is measured ? Sketch line details of 1^{st} and 2^{nd} field.

5. Attempt **any three** : **(3×8=24)**
   1) Explain with neat diagram each block of NTSC coder.
   2) Explain trintron picture tube.
   3) Give elements of cable TV network. Explain block converter used in cable TV.
   4) With block diagram, explain in detail satellite TV system.

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Seat No.	

Set **S**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEMS

Day and Date : Thursday, 18-5-2017 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 necessary****.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) In Audio and Video Compression, voice is sampled at 8000 samples per second with
   a) 5 bits per sample b) 6 bits per sample
   c) 7 bits per sample d) 8 bits per sample

2) In Real Time Interactive Audio Video, data are stored in the buffer at a possibly variable
   a) Pixels b) Packets c) Rates d) Bytes

3) Graphic programs widely used in the graphic arts profession include _____
   a) Desktop publishing programs, image editors and illustration programs
   b) Artificial intelligence, virtual reality and illustration programs
   c) Mega media programs, image editors and desktop publishing programs
   d) Virtual reality, desktop publishing programs and illustration programs

4) For speech, we need to compress the digitize signals at
   a) 128 Khz b) 256 Khz c) 64 Khz d) 1152 Khz

5) In Joint Photographic Experts Group (JPEG), a gray scale picture is divided into blocks of
   a) 5×5 pixels b) 6×6 pixels c) 7×7 pixels d) 8×8 pixels

6) The effect of producing too large displacement of the central beam in picture tube is known as
   a) Comma effect b) Eddy effect
   c) Pincushion effect d) Astigmatism effect

7) The signals U and V are
   a) Same as I and Q
   b) Modified I and Q
   c) Same as colour difference components R-Y and B-Y
   d) None of the above

P.T.O.

8) The colour subcarrier oscillator frequency of NTSC receiver is _____
   a) 5.579545 MHz b) 4.579545 MHz
   c) 3.579545 MHz d) 2.579545 MHz

9) Colour burst is used in PAL to
   a) Synchronize subcarrier phase
   b) To identify the phase alternation line
   c) Detect presence or absence of colour in the transmission
   d) All of the above

10) _____ is the spectral purity of colour light.
   a) Luminance b) Brightness c) Hue d) Saturation

11) Hue complementary to magenta is
   a) Yellow b) Blue c) Cyan d) Green

12) The phase of the colour subcarrier burst signal in PAL system is along the axis at
   a) $\pm 180°$ b) $\pm 45°$ c) $180 \pm 45°$ d) None

13) Delay line matrix is used in PAL receiver
   a) To derive R, G and B colours
   b) To separate the colour difference components
   c) Cancel the phase errors
   d) (b) and (c)

14) Which of the following technique is used for modulating video signal ?
   a) Amplitude modulation b) Pulse code modulation
   c) Picture modulation d) Frequency modulation

15) The process of bringing beam together in picture tube is known as
   a) Convergence b) Purity c) Degaussing d) Pincushion

16) Raster images are also known as
   a) Bitmap images b) Vector images
   c) Clip art images d) Multimedia images

17) Joint Photographic Experts Group (JPEG) is used to compress
   a) Music b) Pictures c) Images d) Frames

18) Moving Picture Experts Group (MPEG-2), was designed for high-quality DVD with a data rate of
   a) 3 to 6 Mbps b) 4 to 6 Mbps c) 5 to 6 Mbps d) 6 to 6 Mbps

19) Convex surfaces may be used to
   a) Absorb the sound b) Spread the sound
   c) Concentrate the sound d) None of the above

20) Rooms vibrate and respond most readily to
   a) Low frequencies b) High frequencies
   c) Mid frequencies d) None of the above

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Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEMS

Day and Date : Thursday, 18-5-2017 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** : **(4×4=16)**
   1) Define the term acoustics and state its requirement.
   2) Compare GIF and JPEG file formats.
   3) List the coding techniques used for audio-video systems.
   4) Explain lossy sequential DCT mode of JPEG.
   5) What is reverberation ? Give its significance in acoustics.

3. Attempt **any three** : **(3×8=24)**
   1) What is real time video ? How coding of real time video is carried out ?
   2) How sound is optically recorded on photographic film using variable density method ?
   3) Why is compression essential in multimedia applications ? Explain MPEG in detail.
   4) Draw the schematic of copier and explain in detail Xerox process.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Why the colour difference signal (G-Y) is not suitable for transmission ?
   2) How chrominance signal is derived from RGB signal in PAL TV system ?
   3) Show that interlaced scanning reduces flicker and conserves bandwidth.
   4) Compare SECAM and PAL TV standards.
   5) How interlaced error is measured ? Sketch line details of 1^{st} and 2^{nd} field.

5. Attempt **any three** : **(3×8=24)**

   1) Explain with neat diagram each block of NTSC coder.

   2) Explain trintron picture tube.

   3) Give elements of cable TV network. Explain block converter used in cable TV.

   4) With block diagram, explain in detail satellite TV system.

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Seat No.	

Set **P**

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Saturday, 20-5-2017 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) In ARM _____ exception is having the highest priority.
a) FIQ b) IRQ c) Reset d) Undefined instruction

2) _____ mode is used when the processor encounters an instruction that is not supported by the implementation.
a) Supervisor b) System c) Undefined d) Abort

3) Let R0=0 × 0000FFFF and R1=0 × 00008000. What will be the content of r1 after execution of instruction "LDR R0, [R1], #4"?
a) 0 × 00008000 b) 0 × 0000FFFF c) 0 × 00008004 d) 0 × 00007FFB

4) A _____ processor has less number of general purpose registers.
a) CICS b) RISC c) Both a) and b) d) None of the above

5) SDA and SCL signal lines are used in _____ communication.
a) SPI b) CAN c) MODBUS d) 12C

6) ARM uses the thumb (_____bit) instruction set to improve code density.
a) 32 b) 8 c) 64 d) 16

7) The carry flag is set to _____ if no borrow occurs and _____ if a borrow occurs.
a) Zero, Zero b) Zero, One c) One, Zero d) None of the above

8) ARM7core architecture support ideally total _____ interrupt sources.
a) 20 b) 30 c) 32 d) 10

9) The on-chip ADC's of LPC2148 has _____ bit resolution and _____ conversion time.
   a) 8, 2.44 μ sec b) 10, 2.44 μ sec c) 12, 1.44 μ sec d) 10, 1.44 μ sec

10) The VIC in LPC2148 can manage _____ vectored interrupt source.
   a) 32 b) 16 c) 22 d) 10

11) Which of the following is a method for obtaining mutual exclusion over a shared resource
   a) Disabling the scheduler
   b) Performing test-and-set operations
   c) Using semaphores
   d) All of the above

12) Information about a task is maintained in a
   a) Stack
   b) Translation look aside buffer
   c) Task control block
   d) Task condition block

13) What occurs when a multitasking kernel decides to run another task
   a) Current task's content gets pushed to current task's stack
   b) Context switching
   c) New task's content is restored and new task resumes
   d) All of the above

14) Binary, mutual exclusion, counting are the types of _____
   a) Queues b) Pipes c) Semaphores d) Mailboxes

15) A _____ is software for controlling, receiving and sending a byte or stream of bytes from or to device.
   a) Kernel b) Shell c) Processor d) Device driver

16) Inter task communication can be done through _____
   a) Mailboxes b) Queues c) Pipes d) All of above

17) In μ cos -II task scheduling mechanism is
   a) Cooperative as well as preemptive
   b) Cyclic only
   c) Preemptive only
   d) Preemptive as well as time slicing round robin

18) μ cos -II and most commercial real-time kernels are _____ because system responsiveness is important.
   a) Preemptive
   b) Non-preemptive
   c) Selective preemption
   d) None of above

19) In real time operating system _____
   a) all tasks have the same priority
   b) a task must be serviced by its deadline period
   c) process scheduling can be done only once
   d) kernel is not required

20) For real time operating systems, interrupt latency should be _____
   a) Minimal
   b) Maximum
   c) Zero
   d) Dependent on the scheduling

_____

SLR-VB – 158

Seat No.	

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Saturday, 20-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

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

SECTION – I

2. Solve **any four** : **(6×4=24)**

a) Write an ARM ASM code to find length of null terminated string.

b) Elaborate in detail the nomenclature used for ARM processors.

c) Interface one LED to LPC2148 port pin P0.2. Write an embedded C program to blink it continuously.

d) Define embedded system. Explain major characteristics which differs embedded system from desktop computer.

e) Discuss and list down the differences between RISC and CISC architecture.

3. Solve **any two** : **(8×2=16)**

a) Discuss the procedure for determining PLL setting in LPC2148 and list required conditions. Also configure CPU clock for 60 MHz if the 10 MHz external crystal is used as a clock source.

b) Discuss the ARM7 programmer's model in detail (Operating modes, register model, program status registers, data types etc.).

c) What is pipeline ? Elaborate the effect of pipeline on program execution with an example.

SECTION – II

4. Solve **any four** : **(6×4=24)**

   a) List down all the µcos-II RTOS features.

   b) Define priority inheritance also elaborate with example.

   c) Discuss the operation and significance of the µcos-II API functions, OSStart() and OSInit().

   d) List down the types of priority-based kernels. Elaborate any one with example.

   e) Define RTOS. Explain preemptive and non preemptive Kernel.

5. Solve **any two** : **(8×2=16)**

   a) Elaborate with examples various inter-task/process communication tools like mailbox, message queue and semaphore used in RTOS environment.

   b) Sketch the block diagram of digital camera and discuss its working.

   c) Interface three LEDs with LPC2148. Draw a neat schematic diagram. Write a simple µcos-II program, which creates 3 LED tasks to blink LEDs in different frequency, 5ms, 10 ms, 20 ms respectively. (Use port pins P0.10 to P0.12).

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SLR-VB – 158

Seat No.	

Set **Q**

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Saturday, 20-5-2017 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) Inter task communication can be done through _____
   a) Mailboxes b) Queues c) Pipes d) All of above

2) In µ cos -II task scheduling mechanism is
   a) Cooperative as well as preemptive
   b) Cyclic only
   c) Preemptive only
   d) Preemptive as well as time slicing round robin

3) µ cos -II and most commercial real-time kernels are _____ because system responsiveness is important.
   a) Preemptive b) Non-preemptive
   c) Selective preemption d) None of above

4) In real time operating system _____
   a) all tasks have the same priority
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   d) kernel is not required

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   c) Zero d) Dependent on the scheduling

P.T.O.

6) In ARM _____ exception is having the highest priority.
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7) _____ mode is used when the processor encounters an instruction that is not supported by the implementation.
   a) Supervisor b) System c) Undefined d) Abort

8) Let R0=0 × 0000FFFF and R1=0 × 00008000. What will be the content of r1 after execution of instruction "LDR R0, [R1], #4"?
   a) 0 × 00008000 b) 0 × 0000FFFF c) 0 × 00008004 d) 0 × 00007FFB

9) A _____ processor has less number of general purpose registers.
   a) CICS b) RISC c) Both a) and b) d) None of the above

10) SDA and SCL signal lines are used in _____ communication.
   a) SPI b) CAN c) MODBUS d) 12C

11) ARM uses the thumb (_____bit) instruction set to improve code density.
   a) 32 b) 8 c) 64 d) 16

12) The carry flag is set to _____ if no borrow occurs and _____ if a borrow occurs.
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13) ARM7core architecture support ideally total _____ interrupt sources.
   a) 20 b) 30 c) 32 d) 10

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15) The VIC in LPC2148 can manage _____ vectored interrupt source.
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16) Which of the following is a method for obtaining mutual exclusion over a shared resource
   a) Disabling the scheduler b) Performing test-and-set operations
   c) Using semaphores d) All of the above

17) Information about a task is maintained in a
   a) Stack b) Translation look aside buffer
   c) Task control block d) Task condition block

18) What occurs when a multitasking kernel decides to run another task
   a) Current task's content gets pushed to current task's stack
   b) Context switching
   c) New task's content is restored and new task resumes
   d) All of the above

19) Binary, mutual exclusion, counting are the types of _____
   a) Queues b) Pipes c) Semaphores d) Mailboxes

20) A _____ is software for controlling, receiving and sending a byte or stream of bytes from or to device.
   a) Kernel b) Shell c) Processor d) Device driver

_____

SLR-VB – 158

Seat No.	

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Saturday, 20-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

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

SECTION – I

2. Solve **any four** : **(6×4=24)**

a) Write an ARM ASM code to find length of null terminated string.

b) Elaborate in detail the nomenclature used for ARM processors.

c) Interface one LED to LPC2148 port pin P0.2. Write an embedded C program to blink it continuously.

d) Define embedded system. Explain major characteristics which differs embedded system from desktop computer.

e) Discuss and list down the differences between RISC and CISC architecture.

3. Solve **any two** : **(8×2=16)**

a) Discuss the procedure for determining PLL setting in LPC2148 and list required conditions. Also configure CPU clock for 60 MHz if the 10 MHz external crystal is used as a clock source.

b) Discuss the ARM7 programmer's model in detail (Operating modes, register model, program status registers, data types etc.).

c) What is pipeline ? Elaborate the effect of pipeline on program execution with an example.

SECTION – II

4. Solve **any four** : **(6×4=24)**

   a) List down all the µcos-II RTOS features.

   b) Define priority inheritance also elaborate with example.

   c) Discuss the operation and significance of the µcos-II API functions, OSStart() and OSInit().

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   e) Define RTOS. Explain preemptive and non preemptive Kernel.

5. Solve **any two** : **(8×2=16)**

   a) Elaborate with examples various inter-task/process communication tools like mailbox, message queue and semaphore used in RTOS environment.

   b) Sketch the block diagram of digital camera and discuss its working.

   c) Interface three LEDs with LPC2148. Draw a neat schematic diagram. Write a simple µcos-II program, which creates 3 LED tasks to blink LEDs in different frequency, 5ms, 10 ms, 20 ms respectively. (Use port pins P0.10 to P0.12).

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SLR-VB – 158

Seat No.	

Set **R**

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Saturday, 20-5-2017 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) Which of the following is a method for obtaining mutual exclusion over a shared resource
   a) Disabling the scheduler b) Performing test-and-set operations
   c) Using semaphores d) All of the above

2) Information about a task is maintained in a
   a) Stack b) Translation look aside buffer
   c) Task control block d) Task condition block

3) What occurs when a multitasking kernel decides to run another task
   a) Current task's content gets pushed to current task's stack
   b) Context switching
   c) New task's content is restored and new task resumes
   d) All of the above

4) Binary, mutual exclusion, counting are the types of _____
   a) Queues b) Pipes c) Semaphores d) Mailboxes

5) A _____ is software for controlling, receiving and sending a byte or stream of bytes from or to device.
   a) Kernel b) Shell c) Processor d) Device driver

6) Inter task communication can be done through _____
   a) Mailboxes b) Queues c) Pipes d) All of above

P.T.O.

7) In µ cos -II task scheduling mechanism is
   a) Cooperative as well as preemptive
   b) Cyclic only
   c) Preemptive only
   d) Preemptive as well as time slicing round robin

8) µ cos -II and most commercial real-time kernels are _____ because system responsiveness is important.
   a) Preemptive b) Non-preemptive
   c) Selective preemption d) None of above

9) In real time operating system _____
   a) all tasks have the same priority
   b) a task must be serviced by its deadline period
   c) process scheduling can be done only once
   d) kernel is not required

10) For real time operating systems, interrupt latency should be _____
   a) Minimal b) Maximum
   c) Zero d) Dependent on the scheduling

11) In ARM _____ exception is having the highest priority.
   a) FIQ b) IRQ c) Reset d) Undefined instruction

12) _____ mode is used when the processor encounters an instruction that is not supported by the implementation.
   a) Supervisor b) System c) Undefined d) Abort

13) Let R0=0 × 0000FFFF and R1=0 × 00008000. What will be the content of r1 after execution of instruction "LDR R0, [R1], #4"?
   a) 0 × 00008000 b) 0 × 0000FFFF c) 0 × 00008004 d) 0 × 00007FFB

14) A _____ processor has less number of general purpose registers.
   a) CICS b) RISC c) Both a) and b) d) None of the above

15) SDA and SCL signal lines are used in _____ communication.
   a) SPI b) CAN c) MODBUS d) 12C

16) ARM uses the thumb (_____bit) instruction set to improve code density.
   a) 32 b) 8 c) 64 d) 16

17) The carry flag is set to _____ if no borrow occurs and _____ if a borrow occurs.
   a) Zero, Zero b) Zero, One c) One, Zero d) None of the above

18) ARM7core architecture support ideally total _____ interrupt sources.
   a) 20 b) 30 c) 32 d) 10

19) The on-chip ADC's of LPC2148 has _____ bit resolution and _____ conversion time.
   a) 8, 2.44 µ sec b) 10, 2.44 µ sec c) 12, 1.44 µ sec d) 10, 1.44 µ sec

20) The VIC in LPC2148 can manage _____ vectored interrupt source.
   a) 32 b) 16 c) 22 d) 10

SLR-VB – 158

Seat No.	

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Saturday, 20-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

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

SECTION – I

2. Solve **any four** : **(6×4=24)**

a) Write an ARM ASM code to find length of null terminated string.

b) Elaborate in detail the nomenclature used for ARM processors.

c) Interface one LED to LPC2148 port pin P0.2. Write an embedded C program to blink it continuously.

d) Define embedded system. Explain major characteristics which differs embedded system from desktop computer.

e) Discuss and list down the differences between RISC and CISC architecture.

3. Solve **any two** : **(8×2=16)**

a) Discuss the procedure for determining PLL setting in LPC2148 and list required conditions. Also configure CPU clock for 60 MHz if the 10 MHz external crystal is used as a clock source.

b) Discuss the ARM7 programmer's model in detail (Operating modes, register model, program status registers, data types etc.).

c) What is pipeline ? Elaborate the effect of pipeline on program execution with an example.

SECTION – II

4. Solve **any four** : **(6×4=24)**

   a) List down all the µcos-II RTOS features.

   b) Define priority inheritance also elaborate with example.

   c) Discuss the operation and significance of the µcos-II API functions, OSStart() and OSInit().

   d) List down the types of priority-based kernels. Elaborate any one with example.

   e) Define RTOS. Explain preemptive and non preemptive Kernel.

5. Solve **any two** : **(8×2=16)**

   a) Elaborate with examples various inter-task/process communication tools like mailbox, message queue and semaphore used in RTOS environment.

   b) Sketch the block diagram of digital camera and discuss its working.

   c) Interface three LEDs with LPC2148. Draw a neat schematic diagram. Write a simple µcos-II program, which creates 3 LED tasks to blink LEDs in different frequency, 5ms, 10 ms, 20 ms respectively. (Use port pins P0.10 to P0.12).

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SLR-VB – 158

Seat No.	

Set **S**

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Saturday, 20-5-2017 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) ARM uses the thumb (_____bit) instruction set to improve code density.
a) 32 b) 8 c) 64 d) 16

2) The carry flag is set to _____ if no borrow occurs and _____ if a borrow occurs.
a) Zero, Zero b) Zero, One c) One, Zero d) None of the above

3) ARM7core architecture support ideally total _____ interrupt sources.
a) 20 b) 30 c) 32 d) 10

4) The on-chip ADC's of LPC2148 has _____ bit resolution and _____ conversion time.
a) 8, 2.44 μ sec b) 10, 2.44 μ sec c) 12, 1.44 μ sec d) 10, 1.44 μ sec

5) The VIC in LPC2148 can manage _____ vectored interrupt source.
a) 32 b) 16 c) 22 d) 10

6) Which of the following is a method for obtaining mutual exclusion over a shared resource
a) Disabling the scheduler b) Performing test-and-set operations
c) Using semaphores d) All of the above

7) Information about a task is maintained in a
a) Stack b) Translation look aside buffer
c) Task control block d) Task condition block

8) What occurs when a multitasking kernel decides to run another task
a) Current task's content gets pushed to current task's stack
b) Context switching
c) New task's content is restored and new task resumes
d) All of the above

P.T.O.

9) Binary, mutual exclusion, counting are the types of _____
   a) Queues b) Pipes c) Semaphores d) Mailboxes

10) A _____ is software for controlling, receiving and sending a byte or stream of bytes from or to device.
   a) Kernel b) Shell c) Processor d) Device driver

11) Inter task communication can be done through _____
   a) Mailboxes b) Queues c) Pipes d) All of above

12) In µ cos -II task scheduling mechanism is
   a) Cooperative as well as preemptive
   b) Cyclic only
   c) Preemptive only
   d) Preemptive as well as time slicing round robin

13) µ cos -II and most commercial real-time kernels are _____ because system responsiveness is important.
   a) Preemptive b) Non-preemptive
   c) Selective preemption d) None of above

14) In real time operating system _____
   a) all tasks have the same priority
   b) a task must be serviced by its deadline period
   c) process scheduling can be done only once
   d) kernel is not required

15) For real time operating systems, interrupt latency should be _____
   a) Minimal b) Maximum
   c) Zero d) Dependent on the scheduling

16) In ARM _____ exception is having the highest priority.
   a) FIQ b) IRQ c) Reset d) Undefined instruction

17) _____ mode is used when the processor encounters an instruction that is not supported by the implementation.
   a) Supervisor b) System c) Undefined d) Abort

18) Let R0=0 × 0000FFFF and R1=0 × 00008000. What will be the content of r1 after execution of instruction “LDR R0, [R1], #4”?
   a) 0 × 00008000 b) 0 × 0000FFFF c) 0 × 00008004 d) 0 × 00007FFB

19) A _____ processor has less number of general purpose registers.
   a) CICS b) RISC c) Both a) and b) d) None of the above

20) SDA and SCL signal lines are used in _____ communication.
   a) SPI b) CAN c) MODBUS d) 12C

_____

SLR-VB – 158

Seat No.	

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Saturday, 20-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

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

SECTION – I

2. Solve **any four** : **(6×4=24)**

a) Write an ARM ASM code to find length of null terminated string.

b) Elaborate in detail the nomenclature used for ARM processors.

c) Interface one LED to LPC2148 port pin P0.2. Write an embedded C program to blink it continuously.

d) Define embedded system. Explain major characteristics which differs embedded system from desktop computer.

e) Discuss and list down the differences between RISC and CISC architecture.

3. Solve **any two** : **(8×2=16)**

a) Discuss the procedure for determining PLL setting in LPC2148 and list required conditions. Also configure CPU clock for 60 MHz if the 10 MHz external crystal is used as a clock source.

b) Discuss the ARM7 programmer's model in detail (Operating modes, register model, program status registers, data types etc.).

c) What is pipeline ? Elaborate the effect of pipeline on program execution with an example.

SECTION – II

4. Solve **any four** : **(6×4=24)**

   a) List down all the µcos-II RTOS features.

   b) Define priority inheritance also elaborate with example.

   c) Discuss the operation and significance of the µcos-II API functions, OSStart() and OSInit().

   d) List down the types of priority-based kernels. Elaborate any one with example.

   e) Define RTOS. Explain preemptive and non preemptive Kernel.

5. Solve **any two** : **(8×2=16)**

   a) Elaborate with examples various inter-task/process communication tools like mailbox, message queue and semaphore used in RTOS environment.

   b) Sketch the block diagram of digital camera and discuss its working.

   c) Interface three LEDs with LPC2148. Draw a neat schematic diagram. Write a simple µcos-II program, which creates 3 LED tasks to blink LEDs in different frequency, 5ms, 10 ms, 20 ms respectively. (Use port pins P0.10 to P0.12).

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SLR-VB – 159

Seat No.	

Set **P**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Tuesday, 23-05-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) ISDN is an example of _____ network.
   a) Circuit switched b) Frame switching
   c) Packet switched d) Cell switching

2) ISDN integrates speech and data on
   a) Different lines b) Same lines
   c) Both of the mentioned d) None of the mentioned

3) ATM and frame relay are
   a) Virtual circuit networks b) Datagram networks
   c) Both a) and b) d) None of the mentioned

4) ATM can be used for
   a) Local area network b) Wide area network
   c) Both a) and b) d) None of the mentioned

5) Virtual circuit identifier in frame relay is called
   a) Data link connection identifier b) Frame relay identifier
   c) Cell relay identifier d) None of the mentioned

6) ATM is well suited for
   a) Voice, interactive data and video transfer
   b) Interactive data transfer but not for voice transfer
   c) Voice and video transfer only
   d) Voice and interactive data transfer only

7) Which of the following is not the function of the AAL ?
   a) Cell header generation
   b) Handling of lost and misinserted cell
   c) Handling of cell delay variation
   d) Segmentation and reassembly of user information

P.T.O.

8) In X.25 each logical channel group is divided into _____ logical channels.
   a) 256 b) 16 c) 4096 d) 2556

9) The packet size in X.25 vary from
   a) 64 bytes to 128 bytes
   b) 64 bytes to 4096 bytes
   c) 64 bytes to 256 bytes
   d) 32 bytes to 64 bytes

10) DLCI can have a value between
   a) 0 and 1025 b) 0 and 125 c) 0 and 256 d) 0 and 1023

11) Advantages of cell relay are
   a) High-speed transmission
   b) Multiplexing transmission
   c) Both a) and b)
   d) None of these

12) ATM networks are
   a) Connectionless
   b) Interconnected
   c) Connection oriented
   d) None of these

13) The purpose of ATM is to provide
   a) High speed
   b) Low-delay multiplexing
   c) Switching networks
   d) All of these

14) The characteristics of ATM are as follows
   a) The transport speeds of most ATM applications are most often 155 Mbps and 622 Mbps
   b) ATM is a flexible service made possible by the fixed size cells
   c) The small cell size allows a variety of applications to run on ATM networks including voice, video and data
   d) All of these

15) The ISDN Internetworking Equipment devices are
   a) Terminal Adapters (TAs)
   b) ISDN Bridges
   c) ISDN Routers
   d) All of these

16) BRI providing data transmission speed of
   a) 62 kbps b) 63 kbps c) 64 kbps d) 65 kbps

17) Section layer is responsible for movement of a signal across a
   a) Physical Signal b) Physical Line c) Physical Section d) Physical Station

18) SONET/SDH is a synchronous network using synchronous
   a) TDM multiplexing
   b) CDMA multiplexing
   c) TDM duplexing
   d) CDMA duplexing

19) _____ is the portion of the network between two multiplexers.
   a) Line b) Path c) Section d) None of the above

20) What is the routing algorithm used in MANETs ?
   a) Shortest Path First
   b) Routing Information Protocol
   c) Distance Vector Protocol
   d) Ad hoc On-demand Distance Vector Protocol

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SLR-VB – 159

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Tuesday, 23-05-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions : *1) Figures to the **right** indicate **full** marks.*
*2) Assume suitable data **if necessary**.*

SECTION – I

2. Attempt **any four** : **(4×5=20)**
   1) Compare between virtual circuit and datagram subnet.
   2) What is the concept of digital switching ? Discuss various benefits of digital switching over analog switching.
   3) Which are the different methods of transmitting ATM cells over physical layer ? Describe SDH based physical layer in brief.
   4) What is the need of flow control in ATM communication ? Describe generic flow control mechanism in brief.
   5) List various modes of operations of an ATM receiver. What is cell delineation algorithm incase of ATM receiver ?

3. Attempt **any two** : **(2×10=20)**
   1) What is latency effect and cell delay variation incase of ATM ? Discuss its effect. List various QoS parameters in ATM and explain each in detail.
   2) List various layers involved in X.25 protocol. What is internal operations and external services incase X.25 ? Draw and explain X.25 packet formats for data packet, control packet and supervisory packet.
   3) Draw ATM cell structure at UNI and NNI and discuss importance and its use in detail.

SECTION – II

4. Attempt **any four** : **(4×5=20)**
   1) List various broadband services and explain them in brief.
   2) Draw the format of ISDN addressing and explain each field.
   3) Draw diagram showing logical and physical hierarchy of SONET and discuss in brief.
   4) What is the need of routing in MANET ? List different routing protocols used in MANET.
   5) Draw IEEE 802.16 protocol architecture and explain it.

5. Attempt **any two** : **(2×10=20)**
   1) Draw the functional diagram of generic ATM switch element and describe its working in detail. List performance parameters related to ATM switching and discuss them in brief.
   2) Draw ISDN architecture and explain it in detail. List various channels available for data transfer in ISDN along with their capacities. Discuss various interfaces available in ISDN.
   3) Draw diagram showing User Network Interface (UNI) related to ISDN and explain it in detail.

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Set P

Set P

SLR-VB – 159

Seat No.	

Set **Q**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Tuesday, 23-05-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) BRI providing data transmission speed of
a) 62 kbps b) 63 kbps c) 64 kbps d) 65 kbps

2) Section layer is responsible for movement of a signal across a
a) Physical Signal b) Physical Line c) Physical Section d) Physical Station

3) SONET/SDH is a synchronous network using synchronous
a) TDM multiplexing b) CDMA multiplexing
c) TDM duplexing d) CDMA duplexing

4) _____ is the portion of the network between two multiplexers.
a) Line b) Path c) Section d) None of the above

5) What is the routing algorithm used in MANETs ?
a) Shortest Path First
b) Routing Information Protocol
c) Distance Vector Protocol
d) Ad hoc On-demand Distance Vector Protocol

6) ISDN is an example of _____ network.
a) Circuit switched b) Frame switching
c) Packet switched d) Cell switching

7) ISDN integrates speech and data on
a) Different lines b) Same lines
c) Both of the mentioned d) None of the mentioned

8) ATM and frame relay are
a) Virtual circuit networks b) Datagram networks
c) Both a) and b) d) None of the mentioned

P.T.O.

9) ATM can be used for
   a) Local area network
   b) Wide area network
   c) Both a) and b)
   d) None of the mentioned

10) Virtual circuit identifier in frame relay is called
   a) Data link connection identifier
   b) Frame relay identifier
   c) Cell relay identifier
   d) None of the mentioned

11) ATM is well suited for
   a) Voice, interactive data and video transfer
   b) Interactive data transfer but not for voice transfer
   c) Voice and video transfer only
   d) Voice and interactive data transfer only

12) Which of the following is not the function of the AAL ?
   a) Cell header generation
   b) Handling of lost and misinserted cell
   c) Handling of cell delay variation
   d) Segmentation and reassembly of user information

13) In X.25 each logical channel group is divided into _____ logical channels.
   a) 256 b) 16 c) 4096 d) 2556

14) The packet size in X.25 vary from
   a) 64 bytes to 128 bytes
   b) 64 bytes to 4096 bytes
   c) 64 bytes to 256 bytes
   d) 32 bytes to 64 bytes

15) DLCI can have a value between
   a) 0 and 1025 b) 0 and 125 c) 0 and 256 d) 0 and 1023

16) Advantages of cell relay are
   a) High-speed transmission
   b) Multiplexing transmission
   c) Both a) and b)
   d) None of these

17) ATM networks are
   a) Connectionless
   b) Interconnected
   c) Connection oriented
   d) None of these

18) The purpose of ATM is to provide
   a) High speed
   b) Low-delay multiplexing
   c) Switching networks
   d) All of these

19) The characteristics of ATM are as follows
   a) The transport speeds of most ATM applications are most often 155 Mbps and 622 Mbps
   b) ATM is a flexible service made possible by the fixed size cells
   c) The small cell size allows a variety of applications to run on ATM networks including voice, video and data
   d) All of these

20) The ISDN Internetworking Equipment devices are
   a) Terminal Adapters (TAs)
   b) ISDN Bridges
   c) ISDN Routers
   d) All of these

SLR-VB – 159

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Tuesday, 23-05-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions : *1) Figures to the **right** indicate **full** marks.*
*2) Assume suitable data **if necessary**.*

SECTION – I

2. Attempt **any four** : **(4×5=20)**
   1) Compare between virtual circuit and datagram subnet.
   2) What is the concept of digital switching ? Discuss various benefits of digital switching over analog switching.
   3) Which are the different methods of transmitting ATM cells over physical layer ? Describe SDH based physical layer in brief.
   4) What is the need of flow control in ATM communication ? Describe generic flow control mechanism in brief.
   5) List various modes of operations of an ATM receiver. What is cell delineation algorithm incase of ATM receiver ?

3. Attempt **any two** : **(2×10=20)**
   1) What is latency effect and cell delay variation incase of ATM ? Discuss its effect. List various QoS parameters in ATM and explain each in detail.
   2) List various layers involved in X.25 protocol. What is internal operations and external services incase X.25 ? Draw and explain X.25 packet formats for data packet, control packet and supervisory packet.
   3) Draw ATM cell structure at UNI and NNI and discuss importance and its use in detail.

SECTION – II

4. Attempt **any four** : **(4×5=20)**
   1) List various broadband services and explain them in brief.
   2) Draw the format of ISDN addressing and explain each field.
   3) Draw diagram showing logical and physical hierarchy of SONET and discuss in brief.
   4) What is the need of routing in MANET ? List different routing protocols used in MANET.
   5) Draw IEEE 802.16 protocol architecture and explain it.

5. Attempt **any two** : **(2×10=20)**
   1) Draw the functional diagram of generic ATM switch element and describe its working in detail. List performance parameters related to ATM switching and discuss them in brief.
   2) Draw ISDN architecture and explain it in detail. List various channels available for data transfer in ISDN along with their capacities. Discuss various interfaces available in ISDN.
   3) Draw diagram showing User Network Interface (UNI) related to ISDN and explain it in detail.

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Set Q

Set Q

SLR-VB – 159

Seat No.	

Set **R**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Tuesday, 23-05-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) Advantages of cell relay are
   a) High-speed transmission b) Multiplexing transmission
   c) Both a) and b) d) None of these

2) ATM networks are
   a) Connectionless b) Interconnected
   c) Connection oriented d) None of these

3) The purpose of ATM is to provide
   a) High speed b) Low-delay multiplexing
   c) Switching networks d) All of these

4) The characteristics of ATM are as follows
   a) The transport speeds of most ATM applications are most often 155 Mbps and 622 Mbps
   b) ATM is a flexible service made possible by the fixed size cells
   c) The small cell size allows a variety of applications to run on ATM networks including voice, video and data
   d) All of these

5) The ISDN Internetworking Equipment devices are
   a) Terminal Adapters (TAs) b) ISDN Bridges
   c) ISDN Routers d) All of these

6) BRI providing data transmission speed of
   a) 62 kbps b) 63 kbps c) 64 kbps d) 65 kbps

7) Section layer is responsible for movement of a signal across a
   a) Physical Signal b) Physical Line
   c) Physical Section d) Physical Station

P.T.O.

8) SONET/SDH is a synchronous network using synchronous
   a) TDM multiplexing b) CDMA multiplexing
   c) TDM duplexing d) CDMA duplexing

9) _____ is the portion of the network between two multiplexers.
   a) Line b) Path c) Section d) None of the above

10) What is the routing algorithm used in MANETs ?
   a) Shortest Path First b) Routing Information Protocol
   c) Distance Vector Protocol d) Ad hoc On-demand Distance Vector Protocol

11) ISDN is an example of _____ network.
   a) Circuit switched b) Frame switching
   c) Packet switched d) Cell switching

12) ISDN integrates speech and data on
   a) Different lines b) Same lines
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13) ATM and frame relay are
   a) Virtual circuit networks b) Datagram networks
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   a) Voice, interactive data and video transfer
   b) Interactive data transfer but not for voice transfer
   c) Voice and video transfer only
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17) Which of the following is not the function of the AAL ?
   a) Cell header generation
   b) Handling of lost and misinserted cell
   c) Handling of cell delay variation
   d) Segmentation and reassembly of user information

18) In X.25 each logical channel group is divided into _____ logical channels.
   a) 256 b) 16 c) 4096 d) 2556

19) The packet size in X.25 vary from
   a) 64 bytes to 128 bytes b) 64 bytes to 4096 bytes
   c) 64 bytes to 256 bytes d) 32 bytes to 64 bytes

20) DLCI can have a value between
   a) 0 and 1025 b) 0 and 125 c) 0 and 256 d) 0 and 1023

SLR-VB – 159

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Tuesday, 23-05-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions : *1) Figures to the **right** indicate **full** marks.*
*2) Assume suitable data **if necessary**.*

SECTION – I

2. Attempt **any four** : **(4×5=20)**
   1) Compare between virtual circuit and datagram subnet.
   2) What is the concept of digital switching ? Discuss various benefits of digital switching over analog switching.
   3) Which are the different methods of transmitting ATM cells over physical layer ? Describe SDH based physical layer in brief.
   4) What is the need of flow control in ATM communication ? Describe generic flow control mechanism in brief.
   5) List various modes of operations of an ATM receiver. What is cell delineation algorithm incase of ATM receiver ?

3. Attempt **any two** : **(2×10=20)**
   1) What is latency effect and cell delay variation incase of ATM ? Discuss its effect. List various QoS parameters in ATM and explain each in detail.
   2) List various layers involved in X.25 protocol. What is internal operations and external services incase X.25 ? Draw and explain X.25 packet formats for data packet, control packet and supervisory packet.
   3) Draw ATM cell structure at UNI and NNI and discuss importance and its use in detail.

SECTION – II

4. Attempt **any four** : **(4×5=20)**
   1) List various broadband services and explain them in brief.
   2) Draw the format of ISDN addressing and explain each field.
   3) Draw diagram showing logical and physical hierarchy of SONET and discuss in brief.
   4) What is the need of routing in MANET ? List different routing protocols used in MANET.
   5) Draw IEEE 802.16 protocol architecture and explain it.

5. Attempt **any two** : **(2×10=20)**
   1) Draw the functional diagram of generic ATM switch element and describe its working in detail. List performance parameters related to ATM switching and discuss them in brief.
   2) Draw ISDN architecture and explain it in detail. List various channels available for data transfer in ISDN along with their capacities. Discuss various interfaces available in ISDN.
   3) Draw diagram showing User Network Interface (UNI) related to ISDN and explain it in detail.

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Set R

Set R

SLR-VB – 159

Seat No.	

Set **S**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Tuesday, 23-05-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) ATM is well suited for
   a) Voice, interactive data and video transfer
   b) Interactive data transfer but not for voice transfer
   c) Voice and video transfer only
   d) Voice and interactive data transfer only

2) Which of the following is not the function of the AAL ?
   a) Cell header generation
   b) Handling of lost and misinserted cell
   c) Handling of cell delay variation
   d) Segmentation and reassembly of user information

3) In X.25 each logical channel group is divided into _____ logical channels.
   a) 256 b) 16 c) 4096 d) 2556

4) The packet size in X.25 vary from
   a) 64 bytes to 128 bytes
   b) 64 bytes to 4096 bytes
   c) 64 bytes to 256 bytes
   d) 32 bytes to 64 bytes

5) DLCI can have a value between
   a) 0 and 1025 b) 0 and 125 c) 0 and 256 d) 0 and 1023

6) Advantages of cell relay are
   a) High-speed transmission
   b) Multiplexing transmission
   c) Both a) and b)
   d) None of these

7) ATM networks are
   a) Connectionless
   b) Interconnected
   c) Connection oriented
   d) None of these

8) The purpose of ATM is to provide
   a) High speed
   b) Low-delay multiplexing
   c) Switching networks
   d) All of these

P.T.O.

9) The characteristics of ATM are as follows
   a) The transport speeds of most ATM applications are most often 155 Mbps and 622 Mbps
   b) ATM is a flexible service made possible by the fixed size cells
   c) The small cell size allows a variety of applications to run on ATM networks including voice, video and data
   d) All of these

10) The ISDN Internetworking Equipment devices are
   a) Terminal Adapters (TAs) b) ISDN Bridges
   c) ISDN Routers d) All of these

11) BRI providing data transmission speed of
   a) 62 kbps b) 63 kbps c) 64 kbps d) 65 kbps

12) Section layer is responsible for movement of a signal across a
   a) Physical Signal b) Physical Line c) Physical Section d) Physical Station

13) SONET/SDH is a synchronous network using synchronous
   a) TDM multiplexing b) CDMA multiplexing
   c) TDM duplexing d) CDMA duplexing

14) _____ is the portion of the network between two multiplexers.
   a) Line b) Path c) Section d) None of the above

15) What is the routing algorithm used in MANETs ?
   a) Shortest Path First
   b) Routing Information Protocol
   c) Distance Vector Protocol
   d) Ad hoc On-demand Distance Vector Protocol

16) ISDN is an example of _____ network.
   a) Circuit switched b) Frame switching
   c) Packet switched d) Cell switching

17) ISDN integrates speech and data on
   a) Different lines b) Same lines
   c) Both of the mentioned d) None of the mentioned

18) ATM and frame relay are
   a) Virtual circuit networks b) Datagram networks
   c) Both a) and b) d) None of the mentioned

19) ATM can be used for
   a) Local area network b) Wide area network
   c) Both a) and b) d) None of the mentioned

20) Virtual circuit identifier in frame relay is called
   a) Data link connection identifier b) Frame relay identifier
   c) Cell relay identifier d) None of the mentioned

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SLR-VB – 159

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Tuesday, 23-05-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

Instructions : *1) Figures to the **right** indicate **full** marks.*
*2) Assume suitable data **if necessary**.*

SECTION – I

2. Attempt **any four** : **(4×5=20)**
   1) Compare between virtual circuit and datagram subnet.
   2) What is the concept of digital switching ? Discuss various benefits of digital switching over analog switching.
   3) Which are the different methods of transmitting ATM cells over physical layer ? Describe SDH based physical layer in brief.
   4) What is the need of flow control in ATM communication ? Describe generic flow control mechanism in brief.
   5) List various modes of operations of an ATM receiver. What is cell delineation algorithm incase of ATM receiver ?

3. Attempt **any two** : **(2×10=20)**
   1) What is latency effect and cell delay variation incase of ATM ? Discuss its effect. List various QoS parameters in ATM and explain each in detail.
   2) List various layers involved in X.25 protocol. What is internal operations and external services incase X.25 ? Draw and explain X.25 packet formats for data packet, control packet and supervisory packet.
   3) Draw ATM cell structure at UNI and NNI and discuss importance and its use in detail.

SECTION – II

4. Attempt **any four** : **(4×5=20)**
   1) List various broadband services and explain them in brief.
   2) Draw the format of ISDN addressing and explain each field.
   3) Draw diagram showing logical and physical hierarchy of SONET and discuss in brief.
   4) What is the need of routing in MANET ? List different routing protocols used in MANET.
   5) Draw IEEE 802.16 protocol architecture and explain it.

5. Attempt **any two** : **(2×10=20)**
   1) Draw the functional diagram of generic ATM switch element and describe its working in detail. List performance parameters related to ATM switching and discuss them in brief.
   2) Draw ISDN architecture and explain it in detail. List various channels available for data transfer in ISDN along with their capacities. Discuss various interfaces available in ISDN.
   3) Draw diagram showing User Network Interface (UNI) related to ISDN and explain it in detail.

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Set S

Set S

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Seat No.	

Set **P**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Tuesday, 23-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *the questions are* ***compulsory****.*
2) Figures to ***right*** *hand side indicate* ***maximum*** *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=20)**

1) When derivative is included in a proportional controller, the proportional band
   a) Increases b) Reduces
   c) Remains unchanged d) None of the above
2) The number of operational amplifiers require for designing of electronic PID controller is
   a) 1 b) 2 c) 3 d) 6
3) Which of the following system provides excellent transient and steady state response ?
   a) Proportional action
   b) Proportional + integral action
   c) Proportional + differential action
   d) Proportional + integral + differential action
4) In a PID controller the offeset has increased. The integral time constant has to be _____ so as to reduce offset.
   a) Reduced b) Increased
   c) Reduced to 0 d) None of the above
5) In a PID controller he overshoots has increased. The derivative time constant has to be so as to reduce the overshoots
   a) Increased b) Reduced
   c) Rduced to 0 d) None of the above
6) For the electric traction which drive is most suitable
   a) Two quadrant b) Four quadrant
   c) Single quadrant d) None of the above
7) Actuators are interfaced with which card of PLC ?
   a) Memory card b) Output card c) Input card d) Power supply

8) Which sensors is self generating type ?
   a) Thermocouple b) RTD c) PT100 d) Thermostat
9) Execution time of PLC depends on
   a) Memory size b) Ladder size
   c) Power supply used for PLC d) Number of I/O
10) The number of I/O for micro PLC are
   a) More than 8 b) Less than 4 c) More than 16 d) More than 32
11) Proportional band of the controller is expressed as
   a) Gain b) Ratio
   c) Percentage d) Range of control varible
12) The term reset control refers to
   a) Proportional b) Integral c) Derivative d) None of these
13) The integral control refers to
   a) Increases the steady state error b) Decreases the steady state error
   c) Increases the noise and stability d) Decreases the damping coefficient
14) The word address in PLC not includes
   a) SMPS b) INPUT c) OUTPUT d) Rack number
15) The device which provides maximum isolation is
   a) Pulse transformer b) Normal transformer
   c) Opto isolator d) None of the above
16) In PID which parameter is responsible for oscillation ?
   a) KP b) KD c) KI d) PO
17) The basic element of ON/OFF controller is
   a) Amplifier b) Comparator
   c) Oscillator d) Differential amplifier
18) Which sensor is semiconductor sensor ?
   a) RTD b) PT100 c) LM335 d) Thermocouple
19) Proportional band of the controller is defined as a range of
   a) Measured variable to the set variable
   b) Air output as the measured variable varies from maximum to minimum
   c) Measured variables through which the air output varies from maximum to minimum
   d) None of the above
20) In a proportional temperature controller, if the quality under the heater increases the offset will
   a) Increase b) Reduce
   c) Remain unaffected d) None of the above

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SLR-VB – 161

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Tuesday, 23-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – 1

2. Solve **any three** : **15**

   a) Why SMPS is preferred over linear power supply in cases of PLC ?

   b) Write a note on classification of PLC.

   c) What are different blocks in PLC ?

   d) State the advantages of PLCs over Hard Wired Relay.

3. Solve **any two** : **15**

   a) Develop a ladder diagram to start and stop the motor using 'START', 'STOP' push buttons(PB).

      Represent the solution as per

      1) Physical ladder
      2) Programmable ladder.

   b) Develop and draw ladder diagram of Automatic bottle filing plant.

   c) What are the different specifications of PLC ? Explain two in detail.

4. Develop a ladder diagram for an elevator. The platform moves the objects UP and DOWN. The platform carries something to UP position when UP button is pushed and when DOWN button is pushed the platform carries something to DOWN position. **10**

SECTION – 2

5. Solve **any three** : **15**

   a) Compare grounded load converter and floating converter.

   b) Design converter for conversion of 0° to 250° into 4 MA to 20 MA with suitable sensor.

   c) Describe design of control logic for DAS.

   d) Explain with neat sketch why the current range is 4 MA to 20 M. Why it is started from 4 MA instead of ZERO.

6. Solve **any two** : **15**

   a) What are different components of robotic system ? How these components are interfaced ?

   b) Explain different types of Float sensor.

   c) Design 2 Channels Data Acquisition System with following specification :

      Channel 1 :

      1) Temp range 0°-900° C.
      2) Sensor-Thermocouple.

      Channel 2 :

      1) Temp range 0°-100° C.
      2) Sensor-LM 35.

7. Design analog proportional controller for following specification : **10**

   1) Process variable range 0°-800° C.
   2) Set point maintained between 400°-600° C.
   3) Use E type thermocouple with sensitivity 7 micro V/° C.
   4) Proportional band 85%.
   5) Assume suitable data.

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Seat No.	

Set **Q**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Tuesday, 23-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) **All** the questions are **compulsory**.*
*2) Figures to **right** hand side indicate **maximum** 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=20)**

1) In PID which parameter is responsible for oscillation ?
a) KP b) KD c) KI d) PO

2) The basic element of ON/OFF controller is
a) Amplifier b) Comparator
c) Oscillator d) Differential amplifier

3) Which sensor is semiconductor sensor ?
a) RTD b) PT100 c) LM335 d) Thermocouple

4) Proportional band of the controller is defined as a range of
a) Measured variable to the set variable
b) Air output as the measured variable varies from maximum to minimum
c) Measured variables through which the air output varies from maximum to minimum
d) None of the above

5) In a proportional temperature controller, if the quality under the heater increases the offset will
a) Increase b) Reduce
c) Remain unaffected d) None of the above

6) When derivative is included in a proportional controller, the proportional band
a) Increases b) Reduces
c) Remains unchanged d) None of the above

7) The number of operational amplifiers require for designing of electronic PID controller is
a) 1 b) 2 c) 3 d) 6

8) Which of the following system provides excellent transient and steady state response ?
   a) Proportional action
   b) Proportional + integral action
   c) Proportional + differential action
   d) Proportional + integral + differential action

9) In a PID controller the offeset has increased. The integral time constant has to be _____ so as to reduce offset.
   a) Reduced b) Increased
   c) Reduced to 0 d) None of the above

10) In a PID controller he overshoots has increased. The derivative time constant has to be so as to reduce the overshoots
   a) Increased b) Reduced
   c) Rduced to 0 d) None of the above

11) For the electric traction which drive is most suitable
   a) Two quadrant b) Four quadrant
   c) Single quadrant d) None of the above

12) Actuators are interfaced with which card of PLC ?
   a) Memory card b) Output card c) Input card d) Power supply

13) Which sensors is self generating type ?
   a) Thermocouple b) RTD c) PT100 d) Thermostat

14) Execution time of PLC depends on
   a) Memory size b) Ladder size
   c) Power supply used for PLC d) Number of I/O

15) The number of I/O for micro PLC are
   a) More than 8 b) Less than 4 c) More than 16 d) More than 32

16) Proportional band of the controller is expressed as
   a) Gain b) Ratio
   c) Percentage d) Range of control varible

17) The term reset control refers to
   a) Proportional b) Integral c) Derivative d) None of these

18) The integral control refers to
   a) Increases the steady state error b) Decreases the steady state error
   c) Increases the noise and stability d) Decreases the damping coefficient

19) The word address in PLC not includes
   a) SMPS b) INPUT c) OUTPUT d) Rack number

20) The device which provides maximum isolation is
   a) Pulse transformer b) Normal transformer
   c) Opto isolator d) None of the above

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Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Tuesday, 23-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – 1

2. Solve **any three** : **15**

   a) Why SMPS is preferred over linear power supply in cases of PLC ?

   b) Write a note on classification of PLC.

   c) What are different blocks in PLC ?

   d) State the advantages of PLCs over Hard Wired Relay.

3. Solve **any two** : **15**

   a) Develop a ladder diagram to start and stop the motor using 'START', 'STOP' push buttons(PB).

      Represent the solution as per

      1) Physical ladder
      2) Programmable ladder.

   b) Develop and draw ladder diagram of Automatic bottle filing plant.

   c) What are the different specifications of PLC ? Explain two in detail.

4. Develop a ladder diagram for an elevator. The platform moves the objects UP and DOWN. The platform carries something to UP position when UP button is pushed and when DOWN button is pushed the platform carries something to DOWN position. **10**

SECTION – 2

5. Solve **any three** : **15**

   a) Compare grounded load converter and floating converter.

   b) Design converter for conversion of 0° to 250° into 4 MA to 20 MA with suitable sensor.

   c) Describe design of control logic for DAS.

   d) Explain with neat sketch why the current range is 4 MA to 20 M. Why it is started from 4 MA instead of ZERO.

6. Solve **any two** : **15**

   a) What are different components of robotic system ? How these components are interfaced ?

   b) Explain different types of Float sensor.

   c) Design 2 Channels Data Acquisition System with following specification :

      Channel 1 :

      1) Temp range 0°-900° C.
      2) Sensor-Thermocouple.

      Channel 2 :

      1) Temp range 0°-100° C.
      2) Sensor-LM 35.

7. Design analog proportional controller for following specification : **10**

   1) Process variable range 0°-800° C.
   2) Set point maintained between 400°-600° C.
   3) Use E type thermocouple with sensitivity 7 micro V/° C.
   4) Proportional band 85%.
   5) Assume suitable data.

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Seat No.	

Set **R**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Tuesday, 23-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) **All** the questions are **compulsory**.*
*2) Figures to **right** hand side indicate **maximum** 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=20)**

1) Proportional band of the controller is expressed as
   a) Gain b) Ratio
   c) Percentage d) Range of control varible

2) The term reset control refers to
   a) Proportional b) Integral c) Derivative d) None of these

3) The integral control refers to
   a) Increases the steady state error b) Decreases the steady state error
   c) Increases the noise and stability d) Decreases the damping coefficient

4) The word address in PLC not includes
   a) SMPS b) INPUT c) OUTPUT d) Rack number

5) The device which provides maximum isolation is
   a) Pulse transformer b) Normal transformer
   c) Opto isolator d) None of the above

6) In PID which parameter is responsible for oscillation ?
   a) KP b) KD c) KI d) PO

7) The basic element of ON/OFF controller is
   a) Amplifier b) Comparator
   c) Oscillator d) Differential amplifier

8) Which sensor is semiconductor sensor ?
   a) RTD b) PT100 c) LM335 d) Thermocouple

9) Proportional band of the controller is defined as a range of
   a) Measured variable to the set variable
   b) Air output as the measured variable varies from maximum to minimum
   c) Measured variables through which the air output varies from maximum to minimum
   d) None of the above

10) In a proportional temperature controller, if the quality under the heater increases the offset will
   a) Increase b) Reduce
   c) Remain unaffected d) None of the above

11) When derivative is included in a proportional controller, the proportional band
   a) Increases b) Reduces
   c) Remains unchanged d) None of the above

12) The number of operational amplifiers require for designing of electronic PID controller is
   a) 1 b) 2 c) 3 d) 6

13) Which of the following system provides excellent transient and steady state response ?
   a) Proportional action
   b) Proportional + integral action
   c) Proportional + differential action
   d) Proportional + integral + differential action

14) In a PID controller the offeset has increased. The integral time constant has to be _____ so as to reduce offset.
   a) Reduced b) Increased
   c) Reduced to 0 d) None of the above

15) In a PID controller he overshoots has increased. The derivative time constant has to be so as to reduce the overshoots
   a) Increased b) Reduced
   c) Rduced to 0 d) None of the above

16) For the electric traction which drive is most suitable
   a) Two quadrant b) Four quadrant
   c) Single quadrant d) None of the above

17) Actuators are interfaced with which card of PLC ?
   a) Memory card b) Output card c) Input card d) Power supply

18) Which sensors is self generating type ?
   a) Thermocouple b) RTD c) PT100 d) Thermostat

19) Execution time of PLC depends on
   a) Memory size b) Ladder size
   c) Power supply used for PLC d) Number of I/O

20) The number of I/O for micro PLC are
   a) More than 8 b) Less than 4 c) More than 16 d) More than 32

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Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Tuesday, 23-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – 1

2. Solve **any three** : **15**

   a) Why SMPS is preferred over linear power supply in cases of PLC ?

   b) Write a note on classification of PLC.

   c) What are different blocks in PLC ?

   d) State the advantages of PLCs over Hard Wired Relay.

3. Solve **any two** : **15**

   a) Develop a ladder diagram to start and stop the motor using 'START', 'STOP' push buttons(PB).

      Represent the solution as per

      1) Physical ladder
      2) Programmable ladder.

   b) Develop and draw ladder diagram of Automatic bottle filing plant.

   c) What are the different specifications of PLC ? Explain two in detail.

4. Develop a ladder diagram for an elevator. The platform moves the objects UP and DOWN. The platform carries something to UP position when UP button is pushed and when DOWN button is pushed the platform carries something to DOWN position. **10**

SECTION – 2

5. Solve **any three** : **15**

   a) Compare grounded load converter and floating converter.

   b) Design converter for conversion of 0° to 250° into 4 MA to 20 MA with suitable sensor.

   c) Describe design of control logic for DAS.

   d) Explain with neat sketch why the current range is 4 MA to 20 M. Why it is started from 4 MA instead of ZERO.

6. Solve **any two** : **15**

   a) What are different components of robotic system ? How these components are interfaced ?

   b) Explain different types of Float sensor.

   c) Design 2 Channels Data Acquisition System with following specification :

      Channel 1 :

      1) Temp range 0°-900° C.
      2) Sensor-Thermocouple.

      Channel 2 :

      1) Temp range 0°-100° C.
      2) Sensor-LM 35.

7. Design analog proportional controller for following specification : **10**

   1) Process variable range 0°-800° C.
   2) Set point maintained between 400°-600° C.
   3) Use E type thermocouple with sensitivity 7 micro V/° C.
   4) Proportional band 85%.
   5) Assume suitable data.

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Seat No.	

Set **S**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Tuesday, 23-5-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *the questions are* ***compulsory****.*
2) Figures to ***right*** *hand side indicate* ***maximum*** *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=20)**

1) For the electric traction which drive is most suitable
   a) Two quadrant b) Four quadrant
   c) Single quadrant d) None of the above
2) Actuators are interfaced with which card of PLC ?
   a) Memory card b) Output card c) Input card d) Power supply
3) Which sensors is self generating type ?
   a) Thermocouple b) RTD c) PT100 d) Thermostat
4) Execution time of PLC depends on
   a) Memory size b) Ladder size
   c) Power supply used for PLC d) Number of I/O
5) The number of I/O for micro PLC are
   a) More than 8 b) Less than 4 c) More than 16 d) More than 32
6) Proportional band of the controller is expressed as
   a) Gain b) Ratio
   c) Percentage d) Range of control varible
7) The term reset control refers to
   a) Proportional b) Integral c) Derivative d) None of these
8) The integral control refers to
   a) Increases the steady state error b) Decreases the steady state error
   c) Increases the noise and stability d) Decreases the damping coefficient
9) The word address in PLC not includes
   a) SMPS b) INPUT c) OUTPUT d) Rack number

P.T.O.

10) The device which provides maximum isolation is
a) Pulse transformer b) Normal transformer
c) Opto isolator d) None of the above

11) In PID which parameter is responsible for oscillation ?
a) KP b) KD c) KI d) PO

12) The basic element of ON/OFF controller is
a) Amplifier b) Comparator
c) Oscillator d) Differential amplifier

13) Which sensor is semiconductor sensor ?
a) RTD b) PT100 c) LM335 d) Thermocouple

14) Proportional band of the controller is defined as a range of
a) Measured variable to the set variable
b) Air output as the measured variable varies from maximum to minimum
c) Measured variables through which the air output varies from maximum to minimum
d) None of the above

15) In a proportional temperature controller, if the quality under the heater increases the offset will
a) Increase b) Reduce
c) Remain unaffected d) None of the above

16) When derivative is included in a proportional controller, the proportional band
a) Increases b) Reduces
c) Remains unchanged d) None of the above

17) The number of operational amplifiers require for designing of electronic PID controller is
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18) Which of the following system provides excellent transient and steady state response ?
a) Proportional action
b) Proportional + integral action
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19) In a PID controller the offeset has increased. The integral time constant has to be _____ so as to reduce offset.
a) Reduced b) Increased
c) Reduced to 0 d) None of the above

20) In a PID controller he overshoots has increased. The derivative time constant has to be so as to reduce the overshoots
a) Increased b) Reduced
c) Rduced to 0 d) None of the above

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Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Tuesday, 23-5-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – 1

2. Solve **any three** : **15**

   a) Why SMPS is preferred over linear power supply in cases of PLC ?

   b) Write a note on classification of PLC.

   c) What are different blocks in PLC ?

   d) State the advantages of PLCs over Hard Wired Relay.

3. Solve **any two** : **15**

   a) Develop a ladder diagram to start and stop the motor using 'START', 'STOP' push buttons(PB).

      Represent the solution as per

      1) Physical ladder
      2) Programmable ladder.

   b) Develop and draw ladder diagram of Automatic bottle filing plant.

   c) What are the different specifications of PLC ? Explain two in detail.

4. Develop a ladder diagram for an elevator. The platform moves the objects UP and DOWN. The platform carries something to UP position when UP button is pushed and when DOWN button is pushed the platform carries something to DOWN position. **10**

SECTION – 2

5. Solve **any three** : **15**

   a) Compare grounded load converter and floating converter.

   b) Design converter for conversion of 0° to 250° into 4 MA to 20 MA with suitable sensor.

   c) Describe design of control logic for DAS.

   d) Explain with neat sketch why the current range is 4 MA to 20 M. Why it is started from 4 MA instead of ZERO.

6. Solve **any two** : **15**

   a) What are different components of robotic system ? How these components are interfaced ?

   b) Explain different types of Float sensor.

   c) Design 2 Channels Data Acquisition System with following specification :

      Channel 1 :

      1) Temp range 0°-900° C.
      2) Sensor-Thermocouple.

      Channel 2 :

      1) Temp range 0°-100° C.
      2) Sensor-LM 35.

7. Design analog proportional controller for following specification : **10**

   1) Process variable range 0°-800° C.
   2) Set point maintained between 400°-600° C.
   3) Use E type thermocouple with sensitivity 7 micro V/° C.
   4) Proportional band 85%.
   5) Assume suitable data.
