SLR-TJ – 140

Seat No.	

Set **P**

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

Day and Date : Tuesday, 12-12-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct option. **14**

1) The particular integral of $(D^2 - 4)y = \sin 3x$ is

a) $\frac{1}{4}$ b) $\frac{-1}{13}\sin 3x$ c) $\frac{-1}{13}\cos 3x$ d) $\frac{-x}{6}\cos 3x$

2) The general solution of $(D^2 - 2)^2 y = 0$ is

a) $y = (c_1 + c_2 x)e^{\sqrt{2x}}$

b) $y = (c_1 + c_2 x)e^{-\sqrt{2x}} + (c_3 + c_4 x)e^{\sqrt{2x}}$

c) $y = c_1 e^{\sqrt{2x}} + c_2 e^{-\sqrt{2x}} + c_3 \cos\sqrt{2}x + c_4 \sin\sqrt{2}x$

d) None of these

3) If $L\{f(t)\} = \phi(s)$ then $L\{tf(t)\} =$

a) $\frac{d}{ds}[\phi(s)]$ b) $\frac{1}{s}\phi(s)$ c) $\frac{-d}{ds}[\phi(s)]$ d) $\int_s^\infty \phi(s)ds$

4) $L\{t^4 e^{-at}\} =$

a) $\frac{4!}{(s+a)^4}$ b) $\frac{4!}{(s-a)^4}$ c) $\frac{4!}{(s+a)^5}$ d) $\frac{5!}{(s-a)^5}$

P.T.O.

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

a) te^{-3t} b) e^{-3t} c) te^{3t} d) t^2e^{-3t}

6) Z-transform of the sequence $\{2^k\}$, $k \geq 0$ is

a) $\frac{Z}{Z+2}$ b) $\frac{1}{Z-2}$

c) $\frac{1}{Z+2}$ d) $\frac{Z}{Z-2}$

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

a) $F\left(\frac{a}{z}\right)$ b) $F\left(\frac{z}{a}\right)$ c) $\frac{1}{a}F\left(\frac{z}{a}\right)$ d) $-\frac{d}{dz}(F(z))$

8) If $f(x) = x^2$ is expanded as cosine series in $(0, \pi)$ then constant term =

a) $\frac{\pi^2}{3}$ b) $\frac{\pi^3}{3}$ c) $\frac{2}{3}\pi^2$ d) $\frac{3}{2}\pi^2$

9) The lines of regression are given by $10y = x + 17$, $x = 5y - 7$ then $\bar{x}$ and $\bar{y}$ are

a) 1 and 3 b) 1 and 5

c) 2 and 3 d) 3 and 2

10) The mean and the standard deviation of a standard normal variate is

a) 1 and 0 b) 0 and 1

c) 1 and 1 d) None of these

11) The positive real root of the equation $x^3 - x - 11 = 0$ lies between

a) 0 and 1 b) 2 and 3

c) 1 and 2 d) 3 and 4

12) As soon as a new value of a variable is found by iteration, it is used immediately in the next-step, this mehtod is called as

a) Gauss-Jacobi's method

b) Gauss-Seidal method

c) Gauss-Elimination method

d) None of these

13) The power method is used to find

a) Smallest eigen value of the matrix

b) Largest eigen value of the matrix

c) Only integer valued eigen value

d) None of these

14) Which of the following functions cannot be expanded as Fourier series in the interval $(-\pi, \pi)$

a) $|x|$ b) cosecx c) e^x d) x^2

SLR-TJ – 140

Seat No.	

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

Day and Date : Tuesday, 12-12-2017 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) Use of non-programmable calculator is ***allowed****.*

SECTION – I

2. Attempt **any three** : **(3×3=9)**

a) Solve $(D^2 - D - 6)y = e^x \cosh 2x$.

b) Solve $(D^2 + 1)y = \sin 3x \cos 2x$.

c) Find $z\{f(k)\}$.

Where $f(k) = 3^k, k < 0$

$= 2^k, k \geq 0$

d) Find $L\{te^{3t}\sin t\}$.

e) Find $L^{-1}\left\{\log\left(\frac{s^2+a^2}{(s+b)^2}\right)\right\}$.

3. Attempt **any three** : **(3×3=9)**

a) Solve $(D^3 + 2D^2 + D)y = x^2 + x$.

b) Find $Z\{K5^K\}, K \geq 0$.

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

d) Find the Laplace transform of $f(t) = K\frac{t}{T}$, $0 < t < T$ if $f(t) = f(t + T)$.

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

4. Attempt **any two**. **(2×5=10)**

a) An electric circuit consists of an inductance L, a condenser of capacity C and an e.m.f. $E = E_0 \cos wt$, so that the charge Q satisfies the differential equation.

$\frac{d^2Q}{dt^2} + \frac{Q}{CL} = \frac{E_0}{L}\cos wt$, If $w^2 = \frac{1}{CL}$ and intially $Q = Q_0$ at $t = 0$ and current is $i = i_0$ at $t = 0$. Find Q in terms of t.

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

c) Evaluate $\int_0^\infty e^{-t}\left(\frac{1-\cos 2t}{t}\right)dt$, by using Laplace transform.

Set P

SECTION – II

5. Attempt **any three** : **9**

1) Compute the coefficient of correlation between x and y from the following data.

x :	2	4	5	6	8	11
y :	18	12	10	8	7	5

2) Find by Newton's method the real root of equation $3x - \cos x - 1 = 0$ correct to four decimal places. Take $x_0 = 1$.

3) Find the half range sine series of $f(x) = lx - x^2$ in $(0, l)$.

4) The number of accidents on a particular highway in a month is a Poisson variate with parameter 5. Find the probability that more than 2 accidents have occurred on the road in a given month.

5) Solve the following system of equations by Gauss Elimination method

$2x + y + z = 10$, $3x + 2y + 3z = 18$, $x + 4y + 9z = 16$.

6. Attempt **any three** : **9**

1) The following results were obtained from the marks in Applied Mechanics and Engineering Mathematics in an examination.

	Marks in App.Mech (x)	**Marks in Engg. Maths (y)**
Mean	47.5	39.5
Standard deviation	16.8	10.8

and coefficient of correlation between x and y is 0.95. Find both the equations of the lines of regression. Also estimate the value of y for x = 30.

2) The size of hats is normally distributed with mean 18.5 cm and standard deviation 2.5 cms. How many hats in total of 2000 will have size between 18 cms and 20 cms ?

(Given : for S.N.V.z area between z = 0 to z = 0.6 is 0.2257 and between z = 0 to z = 0.2 is 0.0793)

3) Find the positive root of $x^3 = 2x + 5$ by false position method (Take 3 iterations)

4) Find the Fourier series of $f(x) = \frac{\pi^2}{12} - \frac{x^2}{4}$ in $(-\pi, \pi)$.

5) Find the Largest eigen value of $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ by power method. Taking $\begin{bmatrix} 0 \\ 1 \end{bmatrix}$ as initial eigen vector.

7. Attempt **any two** : **10**

1) Solve the following system of equations by Gauss-Seidal method, correct upto four decimal places. Take four iterations $x + y + 54z = 110$, $27x + 6y - z = 85$, $6x + 15y + 2z = 72$.

2) Find the Fourier expansion of $f(x) = 4 - x^2$ in the interval $(0, 2)$.

3) Fit a Binomial distribution to the following data :

x :	0	1	2	3	4	5	6
f :	6	20	28	12	8	6	0

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SLR-TJ – 140

Seat No.	

Set Q

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

Day and Date : Tuesday, 12-12-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct option. **14**

1) If $f(x) = x^2$ is expanded as cosine series in $(0, \pi)$ then constant term =

a) $\frac{\pi^2}{3}$ b) $\frac{\pi^3}{3}$ c) $\frac{2}{3}\pi^2$ d) $\frac{3}{2}\pi^2$

2) The lines of regression are given by $10y = x + 17$, $x = 5y - 7$ then $\bar{x}$ and $\bar{y}$ are
   a) 1 and 3 b) 1 and 5
   c) 2 and 3 d) 3 and 2

3) The mean and the standard deviation of a standard normal variate is
   a) 1 and 0 b) 0 and 1
   c) 1 and 1 d) None of these

4) The positive real root of the equation $x^3 - x - 11 = 0$ lies between
   a) 0 and 1 b) 2 and 3
   c) 1 and 2 d) 3 and 4

5) As soon as a new value of a variable is found by iteration, it is used immediately in the next-step, this mehtod is called as
   a) Gauss-Jacobi's method b) Gauss-Seidal method
   c) Gauss-Elimination method d) None of these

6) The power method is used to find
   a) Smallest eigen value of the matrix
   b) Largest eigen value of the matrix
   c) Only integer valued eigen value
   d) None of these

P.T.O.

7) Which of the following functions cannot be expanded as Fourier series in the interval $(-\pi, \pi)$

a) $|x|$ b) $\text{cosec}x$ c) e^x d) x^2

8) The particular integral of $(D^2 - 4)y = \sin 3x$ is

a) $\frac{1}{4}$ b) $\frac{-1}{13}\sin 3x$ c) $\frac{-1}{13}\cos 3x$ d) $\frac{-x}{6}\cos 3x$

9) The general solution of $(D^2 - 2)^2 y = 0$ is

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c) $y = c_1 e^{\sqrt{2x}} + c_2 e^{-\sqrt{2x}} + c_3 \cos\sqrt{2}x + c_4 \sin\sqrt{2}x$

d) None of these

10) If $L\{f(t)\} = \phi(s)$ then $L\{tf(t)\} =$

a) $\frac{d}{ds}[\phi(s)]$ b) $\frac{1}{s}\phi(s)$ c) $\frac{-d}{ds}[\phi(s)]$ d) $\int_s^\infty \phi(s)ds$

11) $L\left\{t^4 e^{-at}\right\} =$

a) $\frac{4!}{(s+a)^4}$ b) $\frac{4!}{(s-a)^4}$ c) $\frac{4!}{(s+a)^5}$ d) $\frac{5!}{(s-a)^5}$

12) $L^{-1}\left\{\frac{1}{(s+3)^2}\right\} =$

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

a) $F\left(\frac{a}{z}\right)$ b) $F\left(\frac{z}{a}\right)$ c) $\frac{1}{a}F\left(\frac{z}{a}\right)$ d) $-\frac{d}{dz}(F(z))$

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SLR-TJ – 140

Seat No.	

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

Day and Date : Tuesday, 12-12-2017 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) Use of non-programmable calculator is **allowed**.*

SECTION – I

2. Attempt **any three** : **(3×3=9)**

a) Solve $(D^2 - D - 6)y = e^x \cosh 2x$.

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c) Find $z\{f(k)\}$.

Where $f(k) = 3^k, k < 0$

$= 2^k, k \geq 0$

d) Find $L\{te^{3t}\sin t\}$.

e) Find $L^{-1}\left\{\log\left(\frac{s^2+a^2}{(s+b)^2}\right)\right\}$.

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a) Solve $(D^3 + 2D^2 + D)y = x^2 + x$.

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c) Evaluate $\int_0^\infty e^{-t}\left(\frac{1-\cos 2t}{t}\right)dt$, by using Laplace transform.

Set Q

SECTION – II

5. Attempt **any three** : **9**

1) Compute the coefficient of correlation between x and y from the following data.

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y :	18	12	10	8	7	5

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Mean	47.5	39.5
Standard deviation	16.8	10.8

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3) Find the positive root of $x^3 = 2x + 5$ by false position method (Take 3 iterations)

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7. Attempt **any two** : **10**

1) Solve the following system of equations by Gauss-Seidal method, correct upto four decimal places. Take four iterations $x + y + 54z = 110$, $27x + 6y - z = 85$, $6x + 15y + 2z = 72$.

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SLR-TJ – 140

Seat No.	

Set **R**

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

Day and Date : Tuesday, 12-12-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions : *1) Figures to the **right** indicate **full** marks.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct option. **14**

1) $L^{-1}\left\{\frac{1}{(s+3)^2}\right\}$ =

a) te^{-3t} b) e^{-3t} c) te^{3t} d) t^2e^{-3t}

2) Z-transform of the sequence $\{2^k\}$, $k \geq 0$ is

a) $\frac{Z}{Z+2}$ b) $\frac{1}{Z-2}$

c) $\frac{1}{Z+2}$ d) $\frac{Z}{Z-2}$

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

a) $F\left(\frac{a}{z}\right)$ b) $F\left(\frac{z}{a}\right)$ c) $\frac{1}{a}F\left(\frac{z}{a}\right)$ d) $-\frac{d}{dz}(F(z))$

4) If $f(x) = x^2$ is expanded as cosine series in $(0, \pi)$ then constant term =

a) $\frac{\pi^2}{3}$ b) $\frac{\pi^3}{3}$ c) $\frac{2}{3}\pi^2$ d) $\frac{3}{2}\pi^2$

5) The lines of regression are given by 10y = x + 17, x = 5y – 7 then $\bar{x}$ and $\bar{y}$ are

a) 1 and 3 b) 1 and 5
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P.T.O.

6) The mean and the standard deviation of a standard normal variate is
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7) The positive real root of the equation $x^3 - x - 11 = 0$ lies between
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   a) $|x|$ b) cosecx c) e^x d) x^2

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12) The general solution of $(D^2 - 2)^2 y = 0$ is
   a) $y = (c_1 + c_2 x)e^{\sqrt{2x}}$
   b) $y = (c_1 + c_2 x)e^{-\sqrt{2x}} + (c_3 + c_4 x)e^{\sqrt{2x}}$
   c) $y = c_1 e^{\sqrt{2x}} + c_2 e^{-\sqrt{2x}} + c_3 \cos\sqrt{2}x + c_4 \sin\sqrt{2}x$
   d) None of these

13) If $L\{f(t)\} = \phi(s)$ then $L\{tf(t)\} =$
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SLR-TJ – 140

Seat No.	

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

Day and Date : Tuesday, 12-12-2017 Marks : 56
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Instructions : *1)* ***All*** *questions are* ***compulsory****.*
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SECTION – I

2. Attempt **any three** : **(3×3=9)**

a) Solve $(D^2 - D - 6)y = e^x \cosh 2x$.

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Where $f(k) = 3^k, k < 0$

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d) Find $L\{te^{3t}\sin t\}$.

e) Find $L^{-1}\left\{\log\left(\frac{s^2+a^2}{(s+b)^2}\right)\right\}$.

3. Attempt **any three** : **(3×3=9)**

a) Solve $(D^3 + 2D^2 + D)y = x^2 + x$.

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

c) Evaluate $\int_0^\infty e^{-t}\left(\frac{1-\cos 2t}{t}\right)dt$, by using Laplace transform.

Set R

SECTION – II

5. Attempt **any three** : **9**

1) Compute the coefficient of correlation between x and y from the following data.

x :	2	4	5	6	8	11
y :	18	12	10	8	7	5

2) Find by Newton's method the real root of equation $3x - \cos x - 1 = 0$ correct to four decimal places. Take $x_0 = 1$.

3) Find the half range sine series of $f(x) = lx - x^2$ in $(0, l)$.

4) The number of accidents on a particular highway in a month is a Poisson variate with parameter 5. Find the probability that more than 2 accidents have occurred on the road in a given month.

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(Given : for S.N.V.z area between z = 0 to z = 0.6 is 0.2257 and between z = 0 to z = 0.2 is 0.0793)

3) Find the positive root of $x^3 = 2x + 5$ by false position method (Take 3 iterations)

4) Find the Fourier series of $f(x) = \frac{\pi^2}{12} - \frac{x^2}{4}$ in $(-\pi, \pi)$.

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2) Find the Fourier expansion of $f(x) = 4 - x^2$ in the interval $(0, 2)$.

3) Fit a Binomial distribution to the following data :

x :	0	1	2	3	4	5	6
f :	6	20	28	12	8	6	0

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SLR-TJ – 140

Seat No.	

Set S

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

Day and Date : Tuesday, 12-12-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct option. **14**

1) The mean and the standard deviation of a standard normal variate is
   a) 1 and 0 b) 0 and 1
   c) 1 and 1 d) None of these

2) The positive real root of the equation $x^3 - x - 11 = 0$ lies between
   a) 0 and 1 b) 2 and 3
   c) 1 and 2 d) 3 and 4

3) As soon as a new value of a variable is found by iteration, it is used immediately in the next-step, this mehtod is called as
   a) Gauss-Jacobi's method
   b) Gauss-Seidal method
   c) Gauss-Elimination method
   d) None of these

4) The power method is used to find
   a) Smallest eigen value of the matrix
   b) Largest eigen value of the matrix
   c) Only integer valued eigen value
   d) None of these

5) Which of the following functions cannot be expanded as Fourier series in the interval $(-\pi, \pi)$
   a) $|x|$ b) cosecx c) e^x d) x^2

6) The particular integral of $(D^2 - 4)y = \sin 3x$ is

P.T.O.

a) $\frac{1}{4}$ b) $\frac{-1}{13}\sin 3x$ c) $\frac{-1}{13}\cos 3x$ d) $\frac{-x}{6}\cos 3x$

7) The general solution of $(D^2 - 2)^2 y = 0$ is

a) $y = (c_1 + c_2 x)\, e^{\sqrt{2x}}$

b) $y = (c_1 + c_2 x)\, e^{-\sqrt{2x}} + (c_3 + c_4 x)\, e^{\sqrt{2x}}$

c) $y = c_1 e^{\sqrt{2x}} + c_2 e^{-\sqrt{2x}} + c_3 \cos\sqrt{2}x + c_4 \sin\sqrt{2}x$

d) None of these

8) If $L\{f(t)\} = \phi(s)$ then $L\{tf(t)\} =$

a) $\frac{d}{ds}[\phi(s)]$ b) $\frac{1}{s}\phi(s)$ c) $\frac{-d}{ds}[\phi(s)]$ d) $\int_s^\infty \phi(s)ds$

9) $L\left\{t^4 e^{-at}\right\} =$

a) $\frac{4!}{(s+a)^4}$ b) $\frac{4!}{(s-a)^4}$ c) $\frac{4!}{(s+a)^5}$ d) $\frac{5!}{(s-a)^5}$

10) $L^{-1}\left\{\frac{1}{(s+3)^2}\right\} =$

a) te^{-3t} b) e^{-3t} c) te^{3t} d) t^2e^{-3t}

11) Z-transform of the sequence $\{2^k\}$, $k \geq 0$ is

a) $\frac{Z}{Z+2}$ b) $\frac{1}{Z-2}$

c) $\frac{1}{Z+2}$ d) $\frac{Z}{Z-2}$

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

a) $F\left(\frac{a}{z}\right)$ b) $F\left(\frac{z}{a}\right)$ c) $\frac{1}{a}F\left(\frac{z}{a}\right)$ d) $-\frac{d}{dz}(F(z))$

13) If $f(x) = x^2$ is expanded as cosine series in $(0, \pi)$ then constant term =

a) $\frac{\pi^2}{3}$ b) $\frac{\pi^3}{3}$ c) $\frac{2}{3}\pi^2$ d) $\frac{3}{2}\pi^2$

14) The lines of regression are given by $10y = x + 17$, $x = 5y - 7$ then $\bar{x}$ and $\bar{y}$ are

a) 1 and 3 b) 1 and 5

c) 2 and 3 d) 3 and 2

SLR-TJ – 140

Seat No.	

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

Day and Date : Tuesday, 12-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

Instructions : 1) ***All*** *questions are* ***compulsory***.
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3) *Use of non-programmable calculator is* ***allowed***.

SECTION – I

2. Attempt **any three** : **(3×3=9)**

a) Solve $(D^2 - D - 6)y = e^x \cosh 2x$.

b) Solve $(D^2 + 1)y = \sin 3x \cos 2x$.

c) Find $z\{f(k)\}$.

Where $f(k) = 3^k, k < 0$

$= 2^k, k \geq 0$

d) Find $L\{te^{3t}\sin t\}$.

e) Find $L^{-1}\left\{\log\left(\frac{s^2+a^2}{(s+b)^2}\right)\right\}$.

3. Attempt **any three** : **(3×3=9)**

a) Solve $(D^3 + 2D^2 + D)y = x^2 + x$.

b) Find $Z\{K5^K\}, K \geq 0$.

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

d) Find the Laplace transform of $f(t) = K\frac{t}{T}$, $0 < t < T$ if $f(t) = f(t + T)$.

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

4. Attempt **any two**. **(2×5=10)**

a) An electric circuit consists of an inductance L, a condenser of capacity C and an e.m.f. $E = E_0 \cos wt$, so that the charge Q satisfies the differential equation.

$\frac{d^2Q}{dt^2} + \frac{Q}{CL} = \frac{E_0}{L}\cos wt$, If $w^2 = \frac{1}{CL}$ and intially $Q = Q_0$ at $t = 0$ and current is $i = i_0$ at $t = 0$. Find Q in terms of t.

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

c) Evaluate $\int_0^\infty e^{-t}\left(\frac{1-\cos 2t}{t}\right)dt$, by using Laplace transform.

Set S

SECTION – II

5. Attempt **any three** : **9**

1) Compute the coefficient of correlation between x and y from the following data.

x :	2	4	5	6	8	11
y :	18	12	10	8	7	5

2) Find by Newton's method the real root of equation $3x - \cos x - 1 = 0$ correct to four decimal places. Take $x_0 = 1$.

3) Find the half range sine series of $f(x) = lx - x^2$ in $(0, l)$.

4) The number of accidents on a particular highway in a month is a Poisson variate with parameter 5. Find the probability that more than 2 accidents have occurred on the road in a given month.

5) Solve the following system of equations by Gauss Elimination method

$2x + y + z = 10$, $3x + 2y + 3z = 18$, $x + 4y + 9z = 16$.

6. Attempt **any three** : **9**

1) The following results were obtained from the marks in Applied Mechanics and Engineering Mathematics in an examination.

	Marks in App.Mech (x)	**Marks in Engg. Maths (y)**
Mean	47.5	39.5
Standard deviation	16.8	10.8

and coefficient of correlation between x and y is 0.95. Find both the equations of the lines of regression. Also estimate the value of y for x = 30.

2) The size of hats is normally distributed with mean 18.5 cm and standard deviation 2.5 cms. How many hats in total of 2000 will have size between 18 cms and 20 cms ?

(Given : for S.N.V.z area between z = 0 to z = 0.6 is 0.2257 and between z = 0 to z = 0.2 is 0.0793)

3) Find the positive root of $x^3 = 2x + 5$ by false position method (Take 3 iterations)

4) Find the Fourier series of $f(x) = \frac{\pi^2}{12} - \frac{x^2}{4}$ in $(-\pi, \pi)$.

5) Find the Largest eigen value of $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ by power method. Taking $\begin{bmatrix} 0 \\ 1 \end{bmatrix}$ as initial eigen vector.

7. Attempt **any two** : **10**

1) Solve the following system of equations by Gauss-Seidal method, correct upto four decimal places. Take four iterations $x + y + 54z = 110$, $27x + 6y - z = 85$, $6x + 15y + 2z = 72$.

2) Find the Fourier expansion of $f(x) = 4 - x^2$ in the interval $(0, 2)$.

3) Fit a Binomial distribution to the following data :

x :	0	1	2	3	4	5	6
f :	6	20	28	12	8	6	0

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SLR-TJ – 141

Seat No.	

Set P

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

Day and Date : Thursday, 14-12-2017 Total 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 the **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 average voltage of a full wave rectifier is
a) $\frac{2Vm}{\pi}$ b) $\frac{Vm}{\pi}$ c) $\frac{Vm}{2\pi}$ d) $\frac{Vm}{2}$

2) The capacitance which exists in a reverse biased junction is _____ capacitance.
a) Diffusion b) Junction
c) Electrolytic d) Storage

3) The load and line regulation of ideal power supply must be
a) Zero b) Infinite
c) Large d) 50%

4) In single phase bridge rectifier PIV is
a) 2 Vm b) Vm
c) 4 Vm d) Same as full wave rectifier

5) A half wave rectifier is equivalent to
a) Clamper circuit b) Series positive clipper
c) Series negative clipper d) Positive clamper

P.T.O.

6) The ripple factor for _____ filter is directly proportional to load resistance.
   a) Inductor b) Capacitor c) CLC d) LC

7) If rms input voltage of trippler circuit has 10 V, the dc output voltage is
   a) 30 b) 25.45 c) $30\sqrt{2}$ d) None of above

8) The main use of common collector amplifier is as
   a) High frequency amplifier b) Audio frequency Amplifier
   c) Impedance matching d) Constant current source

9) Which of the following can be used as constant current source ?
   a) Common emitter configuration b) Common base configuration
   c) Common collector configuration d) Both a) and c)

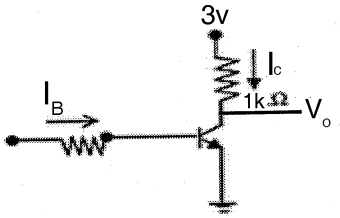
10) Hybrid parameter h21 of network is given by ratio
   a) $\frac{V1}{I1}$ b) $\frac{I1}{I2}$ c) $\frac{I2}{I1}$ d) $\frac{I2}{V2}$

11) JFETs and MOSFETs are
   a) Unipolar and voltage controlled devices
   b) Bipolar and current controlled devices
   c) Unipolar and current controlled devices
   d) Bipolar and voltage controlled devices

12) Stability factor is poor for _____ circuit.
   a) Voltage divider bias b) Self bias
   c) Fixed bias d) Collector to base bias

13) The sine wave can be converted to square wave by
   a) A stable multivibrator b) Schmitt trigger
   c) Monostable multivibrator d) Bistable multivibrator

14) For above circuit if input is absent what is value of Vo ?



   a) 2.3 V b) 3 V c) 0.2 d) 0.7

SLR-TJ – 141

Seat No.	

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

Day and Date : Thursday, 14-12-2017 Marks : 56

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

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) With suitable circuit diagram describe working of voltage trippler circuit.
   2) Derive an expression of ripple factor for CLC filter with bridge rectifier circuit.
   3) Explain transition capacitance and diffusion capacitance for PN junction diode.
   4) Prove that efficiency of full wave rectifier is 81.5%.
   5) Design a zener voltage regulator to provide 10 V output from 15 V unregulated power supply. Assume P_{Dmax} = 400 mW.

3. Attempt **any two** : **(2×6=12)**
   1) Design a power supply using inductor filter to provide dc voltage of 16 V to 18 Ω load resistance having ripple factor better than 5%. Use bridge type rectifier.
   2) What is clamper circuit ? Explain working of positive and negative clamper.
   3) A bridge rectifier circuit is directly operated on single phase 230 V, 50 Hz supply. If R_L is 100 Ω and diode forward resistance is 1 Ω. Calculate the following :
      a) Average load voltage
      b) DC output power
      c) Efficiency
      d) PIV of each diode.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Explain early effect and punch through effect for common base configuration.
   2) 'Q-point at saturation and at cut off results to distortion'. Justify answer with suitable waveforms.
   3) Explain drain characteristics and transfer characteristics DMOSFET.
   4) Explain working of bistable multivibrator. Sketch associated waveforms.
   5) Derive the expression for Current gain (A_i) and Input resistance (R_i) in terms of hybrid parameter for common emitter configuration.

5. Attempt **any two** : **(2×6=12)**
   1) Design a single stage CE voltage amplifier for voltage swing of 5 V peak with load resistance of 5KΩ . Use BC 147 hfe = 240 and hie = 4.5 KΩ .
   2) Explain working of Astable multivibrator. Derive an expression for frequency of oscillation. Sketch associated waveforms.
   3) Explain how stabilization of the operating point is achieved in voltage divider bias circuit. Calculate Q point value and draw dc load line for voltage divider bias circuit for the following specification. V_{CC} = 12 V, R_1 = 9.1 KΩ , R_2 = 4.7 KΩ , R_C = 1 KΩ , R_E = 560 Ω , β = 100.

SLR-TJ – 141

Seat No.	

Set Q

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

Day and Date : Thursday, 14-12-2017 Total Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) **All** questions are **compulsory**.*
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*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 main use of common collector amplifier is as
   a) High frequency amplifier b) Audio frequency Amplifier
   c) Impedance matching d) Constant current source

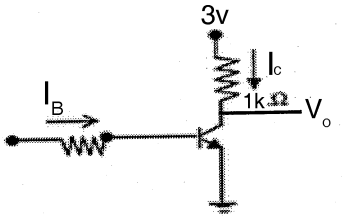
2) Which of the following can be used as constant current source ?
   a) Common emitter configuration b) Common base configuration
   c) Common collector configuration d) Both a) and c)

3) Hybrid parameter h21 of network is given by ratio
   a) $\frac{V1}{I1}$ b) $\frac{I1}{I2}$ c) $\frac{I2}{I1}$ d) $\frac{I2}{V2}$

4) JFETs and MOSFETs are
   a) Unipolar and voltage controlled devices
   b) Bipolar and current controlled devices
   c) Unipolar and current controlled devices
   d) Bipolar and voltage controlled devices

P.T.O.

5) Stability factor is poor for _____ circuit.
   a) Voltage divider bias b) Self bias
   c) Fixed bias d) Collector to base bias
6) The sine wave can be converted to square wave by
   a) A stable multivibrator b) Schmitt trigger
   c) Monostable multivibrator d) Bistable multivibrator
7) For above circuit if input is absent what is value of Vo ?



   a) 2.3 V b) 3 V c) 0.2 d) 0.7
8) The average voltage of a full wave rectifier is
   a) $\frac{2Vm}{\pi}$ b) $\frac{Vm}{\pi}$ c) $\frac{Vm}{2\pi}$ d) $\frac{Vm}{2}$
9) The capacitance which exists in a reverse biased junction is _____ capacitance.
   a) Diffusion b) Junction
   c) Electrolytic d) Storage
10) The load and line regulation of ideal power supply must be
   a) Zero b) Infinite
   c) Large d) 50%
11) In single phase bridge rectifier PIV is
   a) 2 Vm b) Vm
   c) 4 Vm d) Same as full wave rectifier
12) A half wave rectifier is equivalent to
   a) Clamper circuit b) Series positive clipper
   c) Series negative clipper d) Positive clamper
13) The ripple factor for _____ filter is directly proportional to load resistance.
   a) Inductor b) Capacitor c) CLC d) LC
14) If rms input voltage of trippler circuit has 10 V, the dc output voltage is
   a) 30 b) 25.45 c) $30\sqrt{2}$ d) None of above

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SLR-TJ – 141

Seat No.	

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

Day and Date : Thursday, 14-12-2017 Marks : 56

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

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) With suitable circuit diagram describe working of voltage trippler circuit.
   2) Derive an expression of ripple factor for CLC filter with bridge rectifier circuit.
   3) Explain transition capacitance and diffusion capacitance for PN junction diode.
   4) Prove that efficiency of full wave rectifier is 81.5%.
   5) Design a zener voltage regulator to provide 10 V output from 15 V unregulated power supply. Assume P_{Dmax} = 400 mW.

3. Attempt **any two** : **(2×6=12)**
   1) Design a power supply using inductor filter to provide dc voltage of 16 V to 18 Ω load resistance having ripple factor better than 5%. Use bridge type rectifier.
   2) What is clamper circuit ? Explain working of positive and negative clamper.
   3) A bridge rectifier circuit is directly operated on single phase 230 V, 50 Hz supply. If R_L is 100 Ω and diode forward resistance is 1 Ω. Calculate the following :
      a) Average load voltage
      b) DC output power
      c) Efficiency
      d) PIV of each diode.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Explain early effect and punch through effect for common base configuration.
   2) 'Q-point at saturation and at cut off results to distortion'. Justify answer with suitable waveforms.
   3) Explain drain characteristics and transfer characteristics DMOSFET.
   4) Explain working of bistable multivibrator. Sketch associated waveforms.
   5) Derive the expression for Current gain (A_i) and Input resistance (R_i) in terms of hybrid parameter for common emitter configuration.

5. Attempt **any two** : **(2×6=12)**
   1) Design a single stage CE voltage amplifier for voltage swing of 5 V peak with load resistance of 5KΩ . Use BC 147 hfe = 240 and hie = 4.5 KΩ .
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SLR-TJ – 141

Seat No.	

Set R

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

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*4) **Use** of data sheet is **allowed**.*

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) A half wave rectifier is equivalent to
   a) Clamper circuit b) Series positive clipper
   c) Series negative clipper d) Positive clamper

2) The ripple factor for _____ filter is directly proportional to load resistance.
   a) Inductor b) Capacitor c) CLC d) LC

3) If rms input voltage of trippler circuit has 10 V, the dc output voltage is
   a) 30 b) 25.45 c) $30\sqrt{2}$ d) None of above

4) The main use of common collector amplifier is as
   a) High frequency amplifier b) Audio frequency Amplifier
   c) Impedance matching d) Constant current source

5) Which of the following can be used as constant current source ?
   a) Common emitter configuration b) Common base configuration
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P.T.O.

6) Hybrid parameter h21 of network is given by ratio

a) $\frac{V1}{I1}$ b) $\frac{I1}{I2}$ c) $\frac{I2}{I1}$ d) $\frac{I2}{V2}$

7) JFETs and MOSFETs are
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8) Stability factor is poor for _____ circuit.
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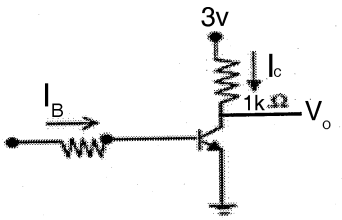
10) For above circuit if input is absent what is value of Vo ?



a) 2.3 V b) 3 V c) 0.2 d) 0.7

11) The average voltage of a full wave rectifier is

a) $\frac{2Vm}{\pi}$ b) $\frac{Vm}{\pi}$ c) $\frac{Vm}{2\pi}$ d) $\frac{Vm}{2}$

12) The capacitance which exists in a reverse biased junction is _____ capacitance.
   a) Diffusion b) Junction
   c) Electrolytic d) Storage

13) The load and line regulation of ideal power supply must be
   a) Zero b) Infinite
   c) Large d) 50%

14) In single phase bridge rectifier PIV is
   a) 2 Vm b) Vm
   c) 4 Vm d) Same as full wave rectifier

_____

SLR-TJ – 141

Seat No.	

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

Day and Date : Thursday, 14-12-2017 Marks : 56

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

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) With suitable circuit diagram describe working of voltage trippler circuit.
   2) Derive an expression of ripple factor for CLC filter with bridge rectifier circuit.
   3) Explain transition capacitance and diffusion capacitance for PN junction diode.
   4) Prove that efficiency of full wave rectifier is 81.5%.
   5) Design a zener voltage regulator to provide 10 V output from 15 V unregulated power supply. Assume P_{Dmax} = 400 mW.

3. Attempt **any two** : **(2×6=12)**
   1) Design a power supply using inductor filter to provide dc voltage of 16 V to 18 Ω load resistance having ripple factor better than 5%. Use bridge type rectifier.
   2) What is clamper circuit ? Explain working of positive and negative clamper.
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      a) Average load voltage
      b) DC output power
      c) Efficiency
      d) PIV of each diode.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Explain early effect and punch through effect for common base configuration.
   2) 'Q-point at saturation and at cut off results to distortion'. Justify answer with suitable waveforms.
   3) Explain drain characteristics and transfer characteristics DMOSFET.
   4) Explain working of bistable multivibrator. Sketch associated waveforms.
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   1) Design a single stage CE voltage amplifier for voltage swing of 5 V peak with load resistance of 5KΩ . Use BC 147 hfe = 240 and hie = 4.5 KΩ .
   2) Explain working of Astable multivibrator. Derive an expression for frequency of oscillation. Sketch associated waveforms.
   3) Explain how stabilization of the operating point is achieved in voltage divider bias circuit. Calculate Q point value and draw dc load line for voltage divider bias circuit for the following specification. V_{CC} = 12 V, R_1 = 9.1 KΩ , R_2 = 4.7 KΩ , R_C = 1 KΩ , R_E = 560 Ω , β = 100.

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SLR-TJ – 141

Seat No.	

Set S

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

Day and Date : Thursday, 14-12-2017 Total 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 the **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) Hybrid parameter h21 of network is given by ratio

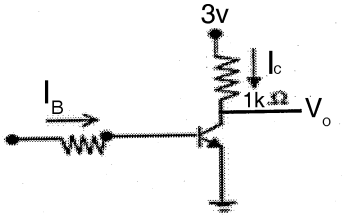
a) $\frac{V1}{I1}$ b) $\frac{I1}{I2}$ c) $\frac{I2}{I1}$ d) $\frac{I2}{V2}$

2) JFETs and MOSFETs are
   a) Unipolar and voltage controlled devices
   b) Bipolar and current controlled devices
   c) Unipolar and current controlled devices
   d) Bipolar and voltage controlled devices

3) Stability factor is poor for _____ circuit.
   a) Voltage divider bias b) Self bias
   c) Fixed bias d) Collector to base bias

4) The sine wave can be converted to square wave by
   a) A stable multivibrator b) Schmitt trigger
   c) Monostable multivibrator d) Bistable multivibrator

5) For above circuit if input is absent what is value of Vo ?



a) 2.3 V b) 3 V c) 0.2 d) 0.7

6) The average voltage of a full wave rectifier is

a) $\frac{2Vm}{\pi}$ b) $\frac{Vm}{\pi}$ c) $\frac{Vm}{2\pi}$ d) $\frac{Vm}{2}$

7) The capacitance which exists in a reverse biased junction is _____ capacitance.

a) Diffusion b) Junction
c) Electrolytic d) Storage

8) The load and line regulation of ideal power supply must be

a) Zero b) Infinite
c) Large d) 50%

9) In single phase bridge rectifier PIV is

a) 2 Vm b) Vm
c) 4 Vm d) Same as full wave rectifier

10) A half wave rectifier is equivalent to

a) Clamper circuit b) Series positive clipper
c) Series negative clipper d) Positive clamper

11) The ripple factor for _____ filter is directly proportional to load resistance.

a) Inductor b) Capacitor c) CLC d) LC

12) If rms input voltage of trippler circuit has 10 V, the dc output voltage is

a) 30 b) 25.45 c) $30\sqrt{2}$ d) None of above

13) The main use of common collector amplifier is as

a) High frequency amplifier b) Audio frequency Amplifier
c) Impedance matching d) Constant current source

14) Which of the following can be used as constant current source ?

a) Common emitter configuration b) Common base configuration
c) Common collector configuration d) Both a) and c)

_____

SLR-TJ – 141

Seat No.	

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

Day and Date : Thursday, 14-12-2017 Marks : 56

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

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) With suitable circuit diagram describe working of voltage trippler circuit.
   2) Derive an expression of ripple factor for CLC filter with bridge rectifier circuit.
   3) Explain transition capacitance and diffusion capacitance for PN junction diode.
   4) Prove that efficiency of full wave rectifier is 81.5%.
   5) Design a zener voltage regulator to provide 10 V output from 15 V unregulated power supply. Assume P_{Dmax} = 400 mW.

3. Attempt **any two** : **(2×6=12)**
   1) Design a power supply using inductor filter to provide dc voltage of 16 V to 18 Ω load resistance having ripple factor better than 5%. Use bridge type rectifier.
   2) What is clamper circuit ? Explain working of positive and negative clamper.
   3) A bridge rectifier circuit is directly operated on single phase 230 V, 50 Hz supply. If R_L is 100 Ω and diode forward resistance is 1 Ω. Calculate the following :
      a) Average load voltage
      b) DC output power
      c) Efficiency
      d) PIV of each diode.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Explain early effect and punch through effect for common base configuration.
   2) 'Q-point at saturation and at cut off results to distortion'. Justify answer with suitable waveforms.
   3) Explain drain characteristics and transfer characteristics DMOSFET.
   4) Explain working of bistable multivibrator. Sketch associated waveforms.
   5) Derive the expression for Current gain (A_i) and Input resistance (R_i) in terms of hybrid parameter for common emitter configuration.

5. Attempt **any two** : **(2×6=12)**
   1) Design a single stage CE voltage amplifier for voltage swing of 5 V peak with load resistance of 5KΩ . Use BC 147 hfe = 240 and hie = 4.5 KΩ .
   2) Explain working of Astable multivibrator. Derive an expression for frequency of oscillation. Sketch associated waveforms.
   3) Explain how stabilization of the operating point is achieved in voltage divider bias circuit. Calculate Q point value and draw dc load line for voltage divider bias circuit for the following specification. V_{CC} = 12 V, R_1 = 9.1 KΩ , R_2 = 4.7 KΩ , R_C = 1 KΩ , R_E = 560 Ω , β = 100.

SLR-TJ – 142

Seat No.	

Set P

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

Day and Date : Saturday, 16-12-2017 Total 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 **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) The maximum power transfer theorem can be applied
   a) Only to DC circuits b) Only to AC circuits
   c) Both AC and DC circuits d) None

2) An attenuator is a
   a) R's network b) RL network c) RC network d) LC network

3) A network function is said to have simple pole or simple zero if
   a) The poles and zeros are on the real axis
   b) The poles and zeros are repetitive
   c) The poles and zeros are complex conjugate to each other
   d) The poles and zeros are not repetitive

4) What is the resonance frequency of parallel resonance circuit, if $R_L = 20\,\Omega$, $R_C = 20$, $C = 10\ \mu F$, $L = 100$ mH ?
   a) 159.15 Hz b) 159.15 KHz c) 1591.5 Hz d) 15.915 Hz

5) If the two port network is reciprocal or bilateral
   a) $Z_{11} = Z_{22}$ b) $Z_{12} = Z_{21}$ c) $Z_{11} = Z_{12}$ d) $Z_{22} = Z_{21}$

6) The time constant of a series RC circuit is
   a) RC b) $\frac{C}{R}$ c) $\frac{R}{C}$ d) e^{-RC}

P.T.O.

7) A Band pass filter may be obtained by
   a) High pass filter followed by a low pass filter
   b) High pass filter followed by a high pass filter
   c) Low pass filter followed by a low pass filter
   d) Low pass filter followed by a high pass filter

8) The necessary condition for the transfer function is that
   a) The coefficients in the polynomials P(S) and Q(S) must be real
   b) Coefficients in Q(S) may be negative
   c) Complex or imaginary poles and zeros may not conjugate
   d) If the real part of pole is zero, then that pole must be multiple

9) Which parameters are widely used in design of transmission line theory ?
   a) Z parameter
   b) Y-parameter
   c) H-parameter
   d) ABCD Parameter

10) The transient response occurs
   a) Only in resistive circuits
   b) Only in capacitive circuits
   c) Only in inductive circuits
   d) Both in inductive and capacitive circuits

11) The number of independent loops for a network with n nodes and b branches is
   a) n – 1
   b) b – n
   c) b – n + 1
   d) None of the above

12) A circuit consists of two resistance R_1 and R_2 in parallel. The total current passing through the circuit is I_T. The current passing through R_1 is

   a) $\frac{I_T R_1}{R_1 + R_2}$ b) $\frac{I_T R_2}{R_1 + R_2}$ c) $\frac{I_T R_1 + R_2}{R_1}$ d) $\frac{I_T (R_1 + R_2)}{R_1}$

13) A certain series resonant circuit has a bandwidth of 1000 Hz. If the existing coil is replaced by a coil with a lower Q, what happens to the bandwidth ?
   a) It increases
   b) It decreases
   c) It is zero
   d) It remains the same

14) A high pass filter is one which
   a) Passes all high frequencies
   b) Attenuates all low frequencies up to cut of frequency
   c) Attenuates all high frequencies
   d) Both a) and b)

SLR-TJ – 142

Seat No.	

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

Day and Date : Saturday, 16-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

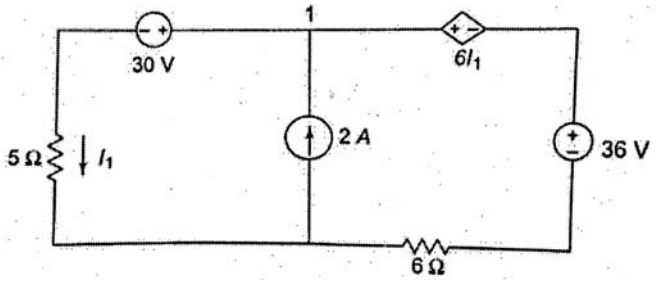
***Instructions** : 1) Figures to the **right** indicate **full** marks.*
*2) **Assume** suitable data **whenever** necessary.*

SECTION – I

2. Answer **any four** : **(4×4=16)**

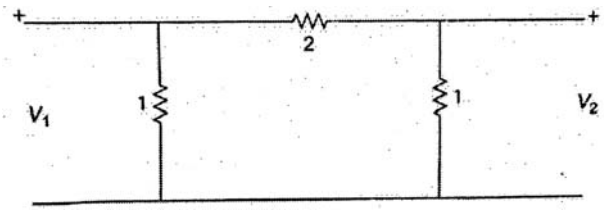
a) State and prove maximum power transfer theorem.

b) Find the current passing through the 5Ω resistor using the nodal method.



c) A series RLC circuit consists of a 50Ω resistance, 0.2H inductance and $10\mu F$ capacitor with an applied voltage of 20V. Determine the resonant frequency. Also find Q factor and Bandwidth of the circuit.

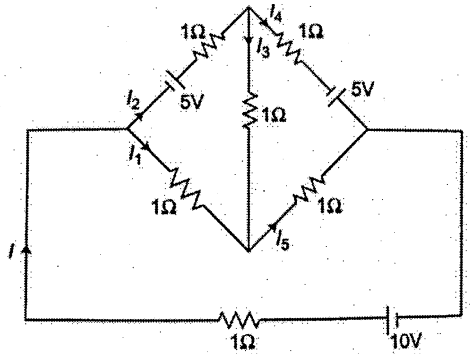
d) Find the Z and Y parameters of the given π network.



e) A series RLC circuit consists of a 10Ω resistance, 0.1 H inductance and $50\mu F$ capacitor with an applied voltage of 100V. Determine the resonant frequency. Also find voltage across inductor at resonance.

3. Answer **any two** : **(6×2=12)**

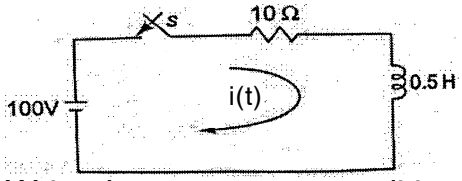
1) Derive an expression for resonant frequency for a parallel RLC network.
2) Prove AD-BC = 1 for a two port network if the given network is reciprocal.
3) Determine the current 'I' in the given network by using Mesh analysis.



SECTION – II

4. Answer **any four** : **(4×4=16)**

a) A series circuit shown in figure consists of a resistance of 10Ω and an inductance of 0.5H is connected to 100 V source at t = 0. Determine the complete expression for i (t).



b) Write the necessary conditions for a driving point function.
c) Design a low pass T-section filter having a cut-off frequency of 1.5 KHz to operate with a terminated load resistance of 600Ω.
d) Design a π-type attenuator to give a 20dB attenuation and with a characteristic impedance of 100Ω.
e) For the given denominator polynomial of a network function, verify the stability of the network using the Routh criterion.
$Q(S) = S^3 + S^2 + 3S + 8$.

5. Answer **any two** : **(6×2=12)**

a) Explain in detail Sinusoidal response of series RL circuit.
b) Design k-type band pass filter having a design impedance of 500Ω and cut-off frequencies 1 KHz and 10 KHz.
c) For the given network function draw the pole zero diagram and hence obtain the time domain response $V(s) = \frac{4S}{(S+2)(S+3)}$.

Set P

SLR-TJ – 142

Seat No.	

Set **Q**

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

Day and Date : Saturday, 16-12-2017 Total Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) Figures to the **right** indicate **full** marks.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The necessary condition for the transfer function is that
   a) The coefficients in the polynomials P(S) and Q(S) must be real
   b) Coefficients in Q(S) may be negative
   c) Complex or imaginary poles and zeros may not conjugate
   d) If the real part of pole is zero, then that pole must be multiple

2) Which parameters are widely used in design of transmission line theory ?
   a) Z parameter b) Y-parameter
   c) H-parameter d) ABCD Parameter

3) The transient response occurs
   a) Only in resistive circuits
   b) Only in capacitive circuits
   c) Only in inductive circuits
   d) Both in inductive and capacitive circuits

4) The number of independent loops for a network with n nodes and b branches is
   a) n – 1 b) b – n
   c) b – n + 1 d) None of the above

5) A circuit consists of two resistance R_1 and R_2 in parallel. The total current passing through the circuit is I_T. The current passing through R_1 is

   a) $\frac{I_T R_1}{R_1 + R_2}$ b) $\frac{I_T R_2}{R_1 + R_2}$ c) $\frac{I_T R_1 + R_2}{R_1}$ d) $\frac{I_T (R_1 + R_2)}{R_1}$

P.T.O.

6) A certain series resonant circuit has a bandwidth of 1000 Hz. If the existing coil is replaced by a coil with a lower Q, what happens to the bandwidth ?
   a) It increases b) It decreases
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7) A high pass filter is one which
   a) Passes all high frequencies
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11) What is the resonance frequency of parallel resonance circuit, if $R_L = 20\,\Omega$, R_C = 20, C = 10 μF , L = 100 mH ?
   a) 159.15 Hz b) 159.15 KHz c) 1591.5 Hz d) 15.915 Hz

12) If the two port network is reciprocal or bilateral
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13) The time constant of a series RC circuit is
   a) RC b) $\frac{C}{R}$ c) $\frac{R}{C}$ d) e^{-RC}

14) A Band pass filter may be obtained by
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SLR-TJ – 142

Seat No.	

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

Day and Date : Saturday, 16-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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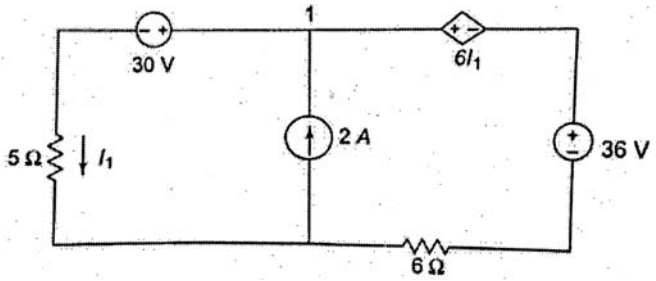
SECTION – I

2. Answer **any four** : **(4×4=16)**

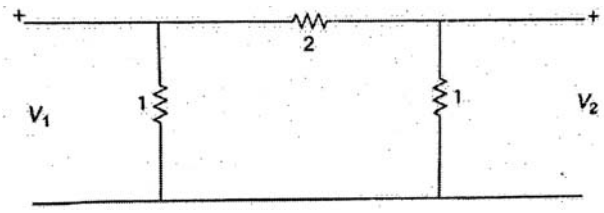
a) State and prove maximum power transfer theorem.

b) Find the current passing through the 5Ω resistor using the nodal method.



c) A series RLC circuit consists of a 50Ω resistance, 0.2H inductance and $10\mu F$ capacitor with an applied voltage of 20V. Determine the resonant frequency. Also find Q factor and Bandwidth of the circuit.

d) Find the Z and Y parameters of the given π network.

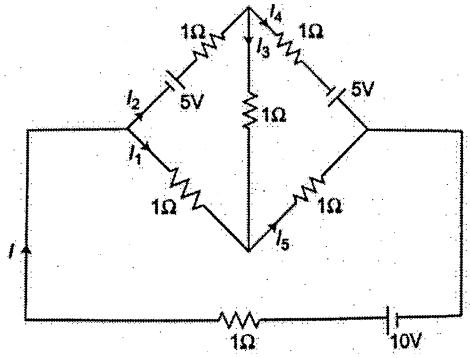


e) A series RLC circuit consists of a 10Ω resistance, 0.1 H inductance and $50\mu F$ capacitor with an applied voltage of 100V. Determine the resonant frequency. Also find voltage across inductor at resonance.

Set Q

3. Answer **any two** : **(6×2=12)**

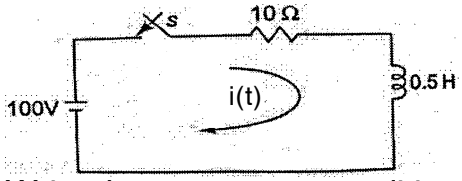
1) Derive an expression for resonant frequency for a parallel RLC network.
2) Prove AD-BC = 1 for a two port network if the given network is reciprocal.
3) Determine the current 'I' in the given network by using Mesh analysis.



SECTION – II

4. Answer **any four** : **(4×4=16)**

a) A series circuit shown in figure consists of a resistance of 10Ω and an inductance of 0.5H is connected to 100 V source at t = 0. Determine the complete expression for i (t).



b) Write the necessary conditions for a driving point function.
c) Design a low pass T-section filter having a cut-off frequency of 1.5 KHz to operate with a terminated load resistance of 600Ω.
d) Design a π-type attenuator to give a 20dB attenuation and with a characteristic impedance of 100Ω.
e) For the given denominator polynomial of a network function, verify the stability of the network using the Routh criterion.
$Q(S) = S^3 + S^2 + 3S + 8$.

5. Answer **any two** : **(6×2=12)**

a) Explain in detail Sinusoidal response of series RL circuit.
b) Design k-type band pass filter having a design impedance of 500Ω and cut-off frequencies 1 KHz and 10 KHz.
c) For the given network function draw the pole zero diagram and hence obtain the time domain response $V(s) = \frac{4S}{(S+2)(S+3)}$.

Set Q

SLR-TJ – 142

Seat No.	

Set **R**

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

Day and Date : Saturday, 16-12-2017 Total Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) Figures to the **right** indicate **full** marks.*
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*4) **Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) If the two port network is reciprocal or bilateral
a) $Z_{11} = Z_{22}$ b) $Z_{12} = Z_{21}$ c) $Z_{11} = Z_{12}$ d) $Z_{22} = Z_{21}$

2) The time constant of a series RC circuit is
a) RC b) $\frac{C}{R}$ c) $\frac{R}{C}$ d) e^{-RC}

3) A Band pass filter may be obtained by
a) High pass filter followed by a low pass filter
b) High pass filter followed by a high pass filter
c) Low pass filter followed by a low pass filter
d) Low pass filter followed by a high pass filter

4) The necessary condition for the transfer function is that
a) The coefficients in the polynomials P(S) and Q(S) must be real
b) Coefficients in Q(S) may be negative
c) Complex or imaginary poles and zeros may not conjugate
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5) Which parameters are widely used in design of transmission line theory ?
a) Z parameter b) Y-parameter
c) H-parameter d) ABCD Parameter

6) The transient response occurs
   a) Only in resistive circuits
   b) Only in capacitive circuits
   c) Only in inductive circuits
   d) Both in inductive and capacitive circuits

7) The number of independent loops for a network with n nodes and b branches is
   a) n – 1 b) b – n
   c) b – n + 1 d) None of the above

8) A circuit consists of two resistance R_1 and R_2 in parallel. The total current passing through the circuit is I_T. The current passing through R_1 is

   a) $\frac{I_T R_1}{R_1 + R_2}$ b) $\frac{I_T R_2}{R_1 + R_2}$ c) $\frac{I_T R_1 + R_2}{R_1}$ d) $\frac{I_T (R_1 + R_2)}{R_1}$

9) A certain series resonant circuit has a bandwidth of 1000 Hz. If the existing coil is replaced by a coil with a lower Q, what happens to the bandwidth ?
   a) It increases b) It decreases
   c) It is zero d) It remains the same

10) A high pass filter is one which
   a) Passes all high frequencies
   b) Attenuates all low frequencies up to cut of frequency
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11) The maximum power transfer theorem can be applied
   a) Only to DC circuits b) Only to AC circuits
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12) An attenuator is a
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14) What is the resonance frequency of parallel resonance circuit, if $R_L = 20\,\Omega$, R_C = 20, C = 10 μF , L = 100 mH ?
   a) 159.15 Hz b) 159.15 KHz c) 1591.5 Hz d) 15.915 Hz

SLR-TJ – 142

Seat No.	

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

Day and Date : Saturday, 16-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

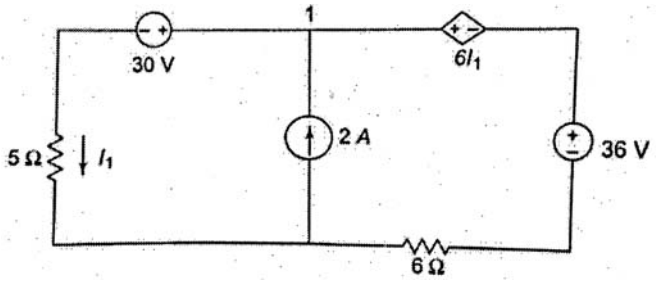
***Instructions** : 1) Figures to the **right** indicate **full** marks.*
*2) **Assume** suitable data **whenever** necessary.*

SECTION – I

2. Answer **any four** : **(4×4=16)**

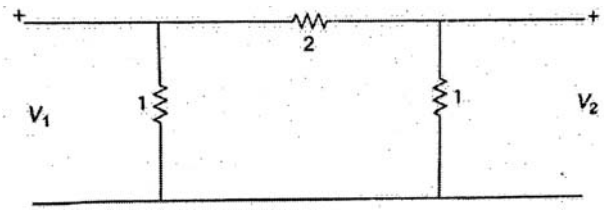
a) State and prove maximum power transfer theorem.

b) Find the current passing through the 5Ω resistor using the nodal method.



c) A series RLC circuit consists of a 50Ω resistance, 0.2H inductance and $10\mu F$ capacitor with an applied voltage of 20V. Determine the resonant frequency. Also find Q factor and Bandwidth of the circuit.

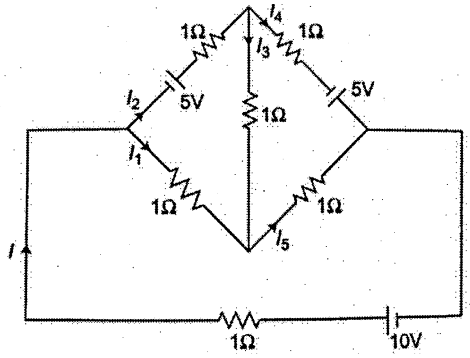
d) Find the Z and Y parameters of the given π network.



e) A series RLC circuit consists of a 10Ω resistance, 0.1 H inductance and $50\mu F$ capacitor with an applied voltage of 100V. Determine the resonant frequency. Also find voltage across inductor at resonance.

3. Answer **any two** : **(6×2=12)**

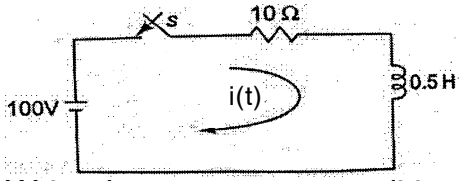
1) Derive an expression for resonant frequency for a parallel RLC network.
2) Prove AD-BC = 1 for a two port network if the given network is reciprocal.
3) Determine the current 'I' in the given network by using Mesh analysis.



SECTION – II

4. Answer **any four** : **(4×4=16)**

a) A series circuit shown in figure consists of a resistance of 10Ω and an inductance of 0.5H is connected to 100 V source at t = 0. Determine the complete expression for i (t).



b) Write the necessary conditions for a driving point function.
c) Design a low pass T-section filter having a cut-off frequency of 1.5 KHz to operate with a terminated load resistance of 600Ω.
d) Design a π-type attenuator to give a 20dB attenuation and with a characteristic impedance of 100Ω.
e) For the given denominator polynomial of a network function, verify the stability of the network using the Routh criterion.
$Q(S) = S^3 + S^2 + 3S + 8$.

5. Answer **any two** : **(6×2=12)**

a) Explain in detail Sinusoidal response of series RL circuit.
b) Design k-type band pass filter having a design impedance of 500Ω and cut-off frequencies 1 KHz and 10 KHz.
c) For the given network function draw the pole zero diagram and hence obtain the time domain response $V(s) = \frac{4S}{(S+2)(S+3)}$.

Set R

SLR-TJ – 142

Seat No.	

Set S

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

Day and Date : Saturday, 16-12-2017 Total 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 **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) The transient response occurs
   a) Only in resistive circuits
   b) Only in capacitive circuits
   c) Only in inductive circuits
   d) Both in inductive and capacitive circuits

2) The number of independent loops for a network with n nodes and b branches is
   a) n – 1 b) b – n
   c) b – n + 1 d) None of the above

3) A circuit consists of two resistance R_1 and R_2 in parallel. The total current passing through the circuit is I_T. The current passing through R_1 is
   a) $\frac{I_T R_1}{R_1 + R_2}$ b) $\frac{I_T R_2}{R_1 + R_2}$ c) $\frac{I_T R_1 + R_2}{R_1}$ d) $\frac{I_T (R_1 + R_2)}{R_1}$

4) A certain series resonant circuit has a bandwidth of 1000 Hz. If the existing coil is replaced by a coil with a lower Q, what happens to the bandwidth ?
   a) It increases b) It decreases
   c) It is zero d) It remains the same

P.T.O.

5) A high pass filter is one which
   a) Passes all high frequencies
   b) Attenuates all low frequencies up to cut of frequency
   c) Attenuates all high frequencies
   d) Both a) and b)

6) The maximum power transfer theorem can be applied
   a) Only to DC circuits b) Only to AC circuits
   c) Both AC and DC circuits d) None

7) An attenuator is a
   a) R's network b) RL network c) RC network d) LC network

8) A network function is said to have simple pole or simple zero if
   a) The poles and zeros are on the real axis
   b) The poles and zeros are repetitive
   c) The poles and zeros are complex conjugate to each other
   d) The poles and zeros are not repetitive

9) What is the resonance frequency of parallel resonance circuit, if $R_L = 20\,\Omega$, $R_C = 20$, C = 10 μF , L = 100 mH ?
   a) 159.15 Hz b) 159.15 KHz c) 1591.5 Hz d) 15.915 Hz

10) If the two port network is reciprocal or bilateral
   a) $Z_{11} = Z_{22}$ b) $Z_{12} = Z_{21}$ c) $Z_{11} = Z_{12}$ d) $Z_{22} = Z_{21}$

11) The time constant of a series RC circuit is
   a) RC b) $\frac{C}{R}$ c) $\frac{R}{C}$ d) e^{-RC}

12) A Band pass filter may be obtained by
   a) High pass filter followed by a low pass filter
   b) High pass filter followed by a high pass filter
   c) Low pass filter followed by a low pass filter
   d) Low pass filter followed by a high pass filter

13) The necessary condition for the transfer function is that
   a) The coefficients in the polynomials P(S) and Q(S) must be real
   b) Coefficients in Q(S) may be negative
   c) Complex or imaginary poles and zeros may not conjugate
   d) If the real part of pole is zero, then that pole must be multiple

14) Which parameters are widely used in design of transmission line theory ?
   a) Z parameter b) Y-parameter
   c) H-parameter d) ABCD Parameter

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SLR-TJ – 142

Seat No.	

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

Day and Date : Saturday, 16-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

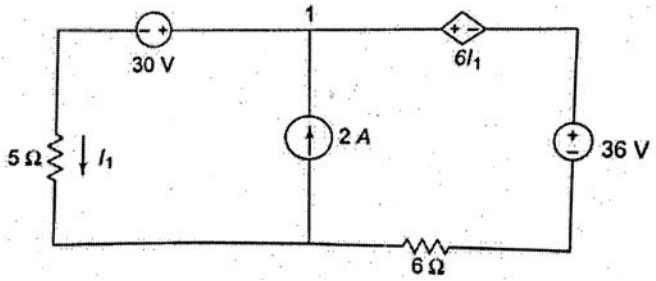
***Instructions** : 1) Figures to the **right** indicate **full** marks.*
*2) **Assume** suitable data **whenever** necessary.*

SECTION – I

2. Answer **any four** : **(4×4=16)**

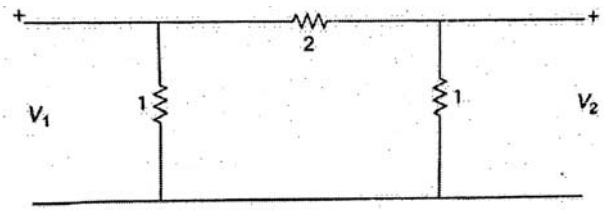
a) State and prove maximum power transfer theorem.

b) Find the current passing through the 5Ω resistor using the nodal method.



c) A series RLC circuit consists of a 50Ω resistance, 0.2H inductance and $10\mu F$ capacitor with an applied voltage of 20V. Determine the resonant frequency. Also find Q factor and Bandwidth of the circuit.

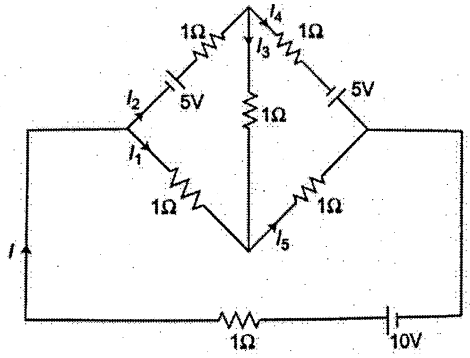
d) Find the Z and Y parameters of the given π network.



e) A series RLC circuit consists of a 10Ω resistance, 0.1 H inductance and $50\mu F$ capacitor with an applied voltage of 100V. Determine the resonant frequency. Also find voltage across inductor at resonance.

3. Answer **any two** : **(6×2=12)**

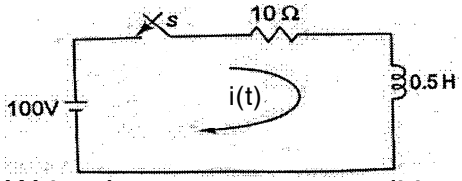
1) Derive an expression for resonant frequency for a parallel RLC network.
2) Prove AD-BC = 1 for a two port network if the given network is reciprocal.
3) Determine the current 'I' in the given network by using Mesh analysis.



SECTION – II

4. Answer **any four** : **(4×4=16)**

a) A series circuit shown in figure consists of a resistance of 10Ω and an inductance of 0.5H is connected to 100 V source at t = 0. Determine the complete expression for i (t).



b) Write the necessary conditions for a driving point function.
c) Design a low pass T-section filter having a cut-off frequency of 1.5 KHz to operate with a terminated load resistance of 600Ω.
d) Design a π-type attenuator to give a 20dB attenuation and with a characteristic impedance of 100Ω.
e) For the given denominator polynomial of a network function, verify the stability of the network using the Routh criterion.
$Q(S) = S^3 + S^2 + 3S + 8$.

5. Answer **any two** : **(6×2=12)**

a) Explain in detail Sinusoidal response of series RL circuit.
b) Design k-type band pass filter having a design impedance of 500Ω and cut-off frequencies 1 KHz and 10 KHz.
c) For the given network function draw the pole zero diagram and hence obtain the time domain response $V(s) = \frac{4S}{(S+2)(S+3)}$.

Set S

SLR-TJ – 143

Seat No.	

Set **P**

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

Day and Date : Tuesday, 19-12-2017 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

SECTION – I

1. Choose the correct answer :

1) The code used for labeling the cells of a k-map is
   a) 8421 binary b) Hexadecimal
   c) Gray d) Octal

2) Each term in the standard POS form is called as
   a) Minterm b) Maxterm
   c) Don't Care d) Literals

3) 6311 Code is
   a) Self Complementary Code b) Non Weighted Code
   c) Alphanumeric Code d) None of the above

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

5) The logic family which consumes least power is
   a) TTL b) ECL c) MOS d) CMOS

6) NAND-NAND realization is equivalent to
   a) AND-NOT Realization b) AND-OR Realization
   c) OR-AND Realization d) NOT-OR Realization

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}

SECTION – II

8) The number of flip flops required for decade counter is
   a) 3 b) 4 c) 5 d) 10

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 complimentary
   d) None of the above

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 combinational PLD with programmable AND array and a fixed OR array is
   a) PLD b) PROM c) PAL d) PLA

13) A flip-flop has two outputs which are
   a) Always zero b) Always complementary
   c) Always one d) None of the above

14) A PLA can be used
   a) To realize sequential logic b) To realize combinational logic
   c) As a memory d) None of these

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SLR-TJ – 143

Seat No.	

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

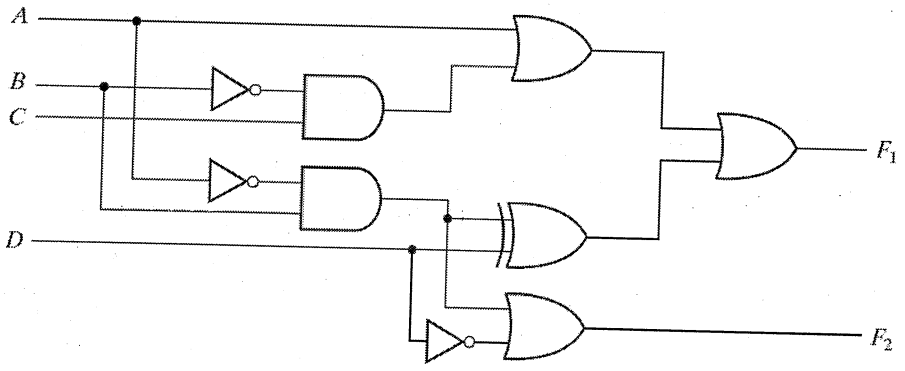
Day and Date : Tuesday, 19-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   a) What is gray code ? List down the properties of the gray code. Write the gray code for data $(10000000)_2$.
   b) Subtract $(1234)_{10}$ from $(234)_{10}$ using r's complement and (r-1)'s complement arithmetic.
   c) Optimize the following Boolean functions by means of a k-map.
      $F(a, b, c, d) = \Pi_M(1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15)$
   d) Design and implement a 1 : 4 de-multiplexer by using only 1 : 2 de-multiplexers. Explain the operation with truth table.
   e) Draw and explain a 4 bit ripple carry adder with neat diagram.

3. Attempt **any two**. **(6×2=12)**
   a) Design and implement a 4 line to 2 line priority encoder.
   b) Design and implement a BCD to Excess-3 code convertor.
   c) Consider the combinational circuit shown. Analyze the circuit to obtain the simplified Boolean expressions for output F1 and F2 in terms of the input variables.



Set P

SECTION – II

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

   a) Implement the Boolean function F(x, y, z) = $\sum$m (0, 3, 5, 6) using PLA.

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

   c) 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.

   d) What are different types of shift register ? Explain PIPO shift register.

   e) Explain a 3 bit twisted ring counter using D flip-flop with neat sketch. What is the modulus of this counter ?

5. Attempt **any two** : **(6×2=12)**

   a) A JK flip-flop has four operations no change, clear to 0, set to 1 and complement, when inputs J and K are 00, 01,10 and 11 respectively. Design a J flip-flop using SR flip-flop. Also derive the characteristic equation, tabulate the characteristic table and the state table for the JK flip-flop.

   b) Design a 4 bit binary 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-TJ – 143

Seat No.	

Set **Q**

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

Day and Date : Tuesday, 19-12-2017 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

SECTION – I

1. Choose the correct answer :

1) 6311 Code is
   a) Self Complementary Code b) Non Weighted Code
   c) Alphanumeric Code d) None of the above

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

3) The logic family which consumes least power is
   a) TTL b) ECL c) MOS d) CMOS

4) NAND-NAND realization is equivalent to
   a) AND-NOT Realization b) AND-OR Realization
   c) OR-AND Realization d) NOT-OR Realization

5) 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}

6) The code used for labeling the cells of a k-map is
   a) 8421 binary b) Hexadecimal
   c) Gray d) Octal

7) Each term in the standard POS form is called as
   a) Minterm b) Maxterm
   c) Don't Care d) Literals

SECTION – II

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

9) 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

10) A combinational PLD with programmable AND array and a fixed OR array is
   a) PLD b) PROM c) PAL d) PLA

11) A flip-flop has two outputs which are
   a) Always zero b) Always complementary
   c) Always one d) None of the above

12) A PLA can be used
   a) To realize sequential logic b) To realize combinational logic
   c) As a memory d) None of these

13) The number of flip flops required for decade counter is
   a) 3 b) 4 c) 5 d) 10

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 complimentary
   d) None of the above

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SLR-TJ – 143

Seat No.	

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

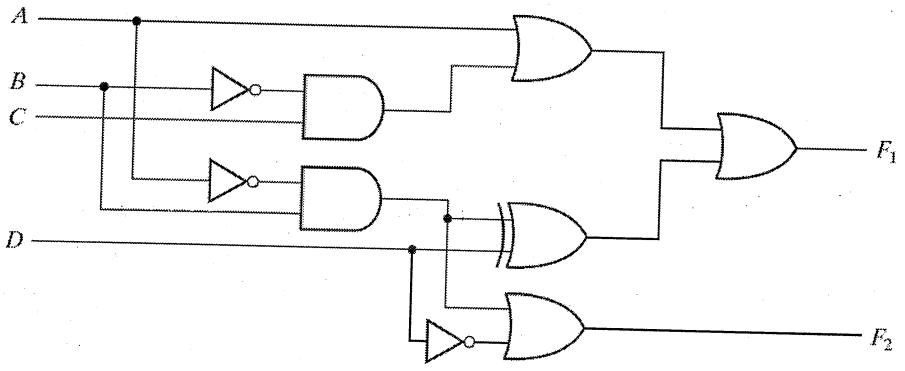
Day and Date : Tuesday, 19-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   a) What is gray code ? List down the properties of the gray code. Write the gray code for data $(10000000)_2$.
   b) Subtract $(1234)_{10}$ from $(234)_{10}$ using r's complement and (r-1)'s complement arithmetic.
   c) Optimize the following Boolean functions by means of a k-map.
      $F(a, b, c, d) = \Pi_M(1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15)$
   d) Design and implement a 1 : 4 de-multiplexer by using only 1 : 2 de-multiplexers. Explain the operation with truth table.
   e) Draw and explain a 4 bit ripple carry adder with neat diagram.

3. Attempt **any two**. **(6×2=12)**
   a) Design and implement a 4 line to 2 line priority encoder.
   b) Design and implement a BCD to Excess-3 code convertor.
   c) Consider the combinational circuit shown. Analyze the circuit to obtain the simplified Boolean expressions for output F1 and F2 in terms of the input variables.



Set Q

SECTION – II

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

   a) Implement the Boolean function F(x, y, z) = $\sum$m (0, 3, 5, 6) using PLA.

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

   c) 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.

   d) What are different types of shift register ? Explain PIPO shift register.

   e) Explain a 3 bit twisted ring counter using D flip-flop with neat sketch. What is the modulus of this counter ?

5. Attempt **any two** : **(6×2=12)**

   a) A JK flip-flop has four operations no change, clear to 0, set to 1 and complement, when inputs J and K are 00, 01,10 and 11 respectively. Design a J flip-flop using SR flip-flop. Also derive the characteristic equation, tabulate the characteristic table and the state table for the JK flip-flop.

   b) Design a 4 bit binary 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-TJ – 143

Seat No.	

Set **R**

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

Day and Date : Tuesday, 19-12-2017 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

SECTION – I

1. Choose the correct answer :

1) The logic family which consumes least power is
   a) TTL b) ECL c) MOS d) CMOS

2) NAND-NAND realization is equivalent to
   a) AND-NOT Realization b) AND-OR Realization
   c) OR-AND Realization d) NOT-OR Realization

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) The code used for labeling the cells of a k-map is
   a) 8421 binary b) Hexadecimal
   c) Gray d) Octal

5) Each term in the standard POS form is called as
   a) Minterm b) Maxterm
   c) Don't Care d) Literals

6) 6311 Code is
   a) Self Complementary Code b) Non Weighted Code
   c) Alphanumeric Code d) None of the above

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

P.T.O.

SECTION – II

8) A combinational PLD with programmable AND array and a fixed OR array is
   a) PLD b) PROM c) PAL d) PLA

9) A flip-flop has two outputs which are
   a) Always zero b) Always complementary
   c) Always one d) None of the above

10) A PLA can be used
   a) To realize sequential logic b) To realize combinational logic
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11) The number of flip flops required for decade counter is
   a) 3 b) 4 c) 5 d) 10

12) The race around condition occurs in a J-K flip-flop when
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13) How many states a 6 bit ripple counter can have ?
   a) 6 b) 12 c) 32 d) 64

14) For PAL design of logic circuit, a single lateral term
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SLR-TJ – 143

Seat No.	

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

Day and Date : Tuesday, 19-12-2017 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 gray code ? List down the properties of the gray code. Write the gray code for data $(10000000)_2$.
   b) Subtract $(1234)_{10}$ from $(234)_{10}$ using r's complement and (r-1)'s complement arithmetic.
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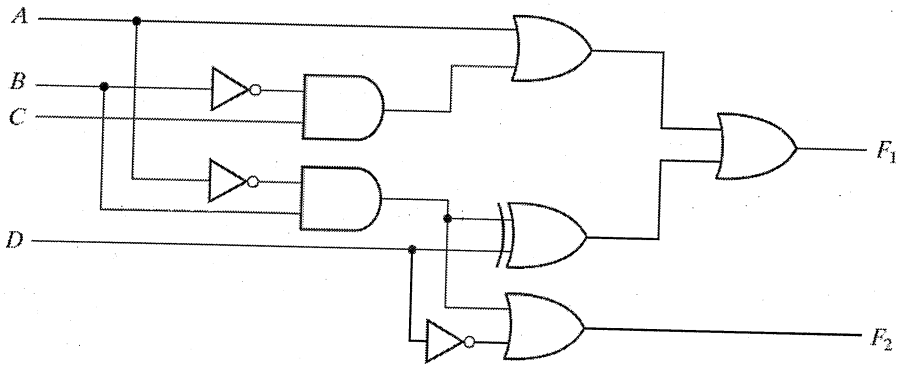
      $F(a, b, c, d) = \Pi_M(1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15)$
   d) Design and implement a 1 : 4 de-multiplexer by using only 1 : 2 de-multiplexers. Explain the operation with truth table.
   e) Draw and explain a 4 bit ripple carry adder with neat diagram.

3. Attempt **any two**. **(6×2=12)**
   a) Design and implement a 4 line to 2 line priority encoder.
   b) Design and implement a BCD to Excess-3 code convertor.
   c) Consider the combinational circuit shown. Analyze the circuit to obtain the simplified Boolean expressions for output F1 and F2 in terms of the input variables.



Set R

SECTION – II

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

   a) Implement the Boolean function F(x, y, z) = $\sum$m (0, 3, 5, 6) using PLA.

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

   c) 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.

   d) What are different types of shift register ? Explain PIPO shift register.

   e) Explain a 3 bit twisted ring counter using D flip-flop with neat sketch. What is the modulus of this counter ?

5. Attempt **any two** : **(6×2=12)**

   a) A JK flip-flop has four operations no change, clear to 0, set to 1 and complement, when inputs J and K are 00, 01,10 and 11 respectively. Design a J flip-flop using SR flip-flop. Also derive the characteristic equation, tabulate the characteristic table and the state table for the JK flip-flop.

   b) Design a 4 bit binary 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-TJ – 143

Seat No.	

Set S

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

Day and Date : Tuesday, 19-12-2017 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

SECTION – I

1. Choose the correct answer :

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

2) The logic family which consumes least power is
   a) TTL b) ECL c) MOS d) CMOS

3) NAND-NAND realization is equivalent to
   a) AND-NOT Realization b) AND-OR Realization
   c) OR-AND Realization d) NOT-OR Realization

4) 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}

5) The code used for labeling the cells of a k-map is
   a) 8421 binary b) Hexadecimal
   c) Gray d) Octal

6) Each term in the standard POS form is called as
   a) Minterm b) Maxterm
   c) Don't Care d) Literals

7) 6311 Code is
   a) Self Complementary Code b) Non Weighted Code
   c) Alphanumeric Code d) None of the above

P.T.O.

SECTION – II

8) 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

9) A combinational PLD with programmable AND array and a fixed OR array is
   a) PLD b) PROM c) PAL d) PLA

10) A flip-flop has two outputs which are
   a) Always zero b) Always complementary
   c) Always one d) None of the above

11) A PLA can be used
   a) To realize sequential logic b) To realize combinational logic
   c) As a memory d) None of these

12) The number of flip flops required for decade counter is
   a) 3 b) 4 c) 5 d) 10

13) 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 complimentary
   d) None of the above

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

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SLR-TJ – 143

Seat No.	

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

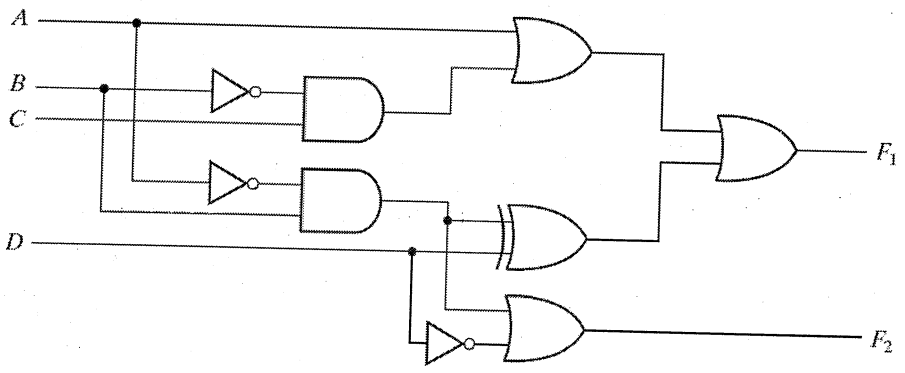
Day and Date : Tuesday, 19-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   a) What is gray code ? List down the properties of the gray code. Write the gray code for data $(10000000)_2$.
   b) Subtract $(1234)_{10}$ from $(234)_{10}$ using r's complement and (r-1)'s complement arithmetic.
   c) Optimize the following Boolean functions by means of a k-map.
      $F(a, b, c, d) = \Pi_M(1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15)$
   d) Design and implement a 1 : 4 de-multiplexer by using only 1 : 2 de-multiplexers. Explain the operation with truth table.
   e) Draw and explain a 4 bit ripple carry adder with neat diagram.

3. Attempt **any two**. **(6×2=12)**
   a) Design and implement a 4 line to 2 line priority encoder.
   b) Design and implement a BCD to Excess-3 code convertor.
   c) Consider the combinational circuit shown. Analyze the circuit to obtain the simplified Boolean expressions for output F1 and F2 in terms of the input variables.



Set S

SECTION – II

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

   a) Implement the Boolean function F(x, y, z) = $\sum$m (0, 3, 5, 6) using PLA.

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

   c) 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.

   d) What are different types of shift register ? Explain PIPO shift register.

   e) Explain a 3 bit twisted ring counter using D flip-flop with neat sketch. What is the modulus of this counter ?

5. Attempt **any two** : **(6×2=12)**

   a) A JK flip-flop has four operations no change, clear to 0, set to 1 and complement, when inputs J and K are 00, 01,10 and 11 respectively. Design a J flip-flop using SR flip-flop. Also derive the characteristic equation, tabulate the characteristic table and the state table for the JK flip-flop.

   b) Design a 4 bit binary 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-TJ – 144

Seat No.	

Set P

S.E. (Electronics Engineering) (New CBCS) (Part – I) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 21-12-2017 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****.*
4) ***All*** *questions are* ***compulsory****.*
5) Figures to the ***right*** *indicates* ***full*** *marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer :

1) In a low level amplitude modulation system, the amplifier following the modulated stage must be
   a) Linear device b) Non linear device
   c) Harmonics device d) Class C amplifier

2) Thermal noise voltage in a resistor R is given by
   a) $\sqrt{4RkTB}$ b) kTB c) TBk^2 d) None

3) In an amplitude modulated waveform the amplitude of side bands is
   a) Independent of the carrier amplitude
   b) Independent of the modulation index
   c) Carrier amplitude x modulation index
   d) 1/2 carrier amplitude x modulation index

4) An amplitude modulated voltage in volts is given by v = 20 (1 + 0.5 sin 6280 t) sin (6.28 x 106)t. The rms value of the unmodulated carrier voltage in volts is
   a) 20 b) 20/√2 c) 10 d) 10/√2

5) The relation between carrier power and total power in an AM wave is
   a) $P_C = P_T\left(1+\frac{m^2}{4}\right)$ b) $P_C = P_T\left(1+\frac{m^2}{2}\right)$
   c) $P_T = P_C\left(1+\frac{m^2}{4}\right)$ d) $P_T = P_C\left(1+\frac{m^2}{2}\right)$

6) In superhetrodyne receiver the frequency of local oscillator is
   a) higher than the incoming signal frequency
   b) lower than the incoming signal frequency
   c) equal to the incoming signal frequency
   d) none of above

7) In a radio receiver with simple AGC
   a) the highest AGC voltage is produced between stations
   b) an increase signal strength produces more AGC
   c) audio stage gain is normally controlled by the AGC
   d) the faster the AGC time constant, the more accurate the output

8) In PM, the frequency deviation is proportional to
   a) only modulating frequency
   b) both amplitude and frequency
   c) only amplitude of modulating sigma
   d) antenna height

9) Which of the following statement is not valid for Amstong modulation system ?
   a) the system is basically PM not FM
   b) AFC is not needed as a crystal oscillator is used
   c) frequency multiplication must be used
   d) equalization is unnecessary

10) Broadcasting antenna are generally
   a) omni directional antenna b) vertical type
   c) horizontal type d) all of these

11) During day time, the ionosphere consists of
   a) D, E, F layers b) D, E, F_1 layers
   c) D, E, F_2 layers d) D, E, F_1, F_2 layers

12) The ionosphere plays a significant role in radio wave propagation at
   a) high frequency b) ultra high frequency
   c) microwaves frequencies d) optical frequencies

13) In telephone the frequency of ringing tone is
   a) 33 Hz b) 133 Hz c) 400 Hz d) None

14) Number of call attempts in a busy hour is called
   a) Busy Hour Call Attempts b) Call Completion Rate
   c) Busy Hour Calling Rate d) Traffic Intensity

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SLR-TJ – 144

Seat No.	

S.E. (Electronics Engineering) (New CBCS) (Part – I) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 21-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any four** : **16**

a) Why modulation is required ?

b) What are the different types of communication channels ?

c) Explain Negative feedback Circuitry.

d) Draw and explain superhetrodyne receiver.

e) Define Bandwidth. The resonant frequency of RF amplifier of a receiver is a 1 MHz and its bandwidth is 10 KHz. What is the Q Factor ?

3. Solve **any two** : **12**

a) The output voltage of a transmitter is given by 400(1 + 0.4 sin 6280 t) sin 3.14 x 107 t. this voltage is fed to a load of 600 Ω resistance.
Determine : i) Carrier frequency
ii) Modulating frequency
iii) Carrier power
iv) Total power output
v) Peak power output.

b) Comparison between DSB, SSB, ISB and VSB with different parameters.

c) Draw and explain TRF radio receiver. Discuss its advantages and disadvantages.

SECTION – II

4. Attempt **any four** : **16**

   a) The carrier swing of a frequency modulated signal is 70 KHz and the modulating signal is a 7 KHz sine wave determine the modulation index of the FM signal.

   b) Explain pre-emphasis and de emphasis in brief.

   c) Explain in brief pulsed dialing and DTMF.

   d) Define characteristics of antenna.

   e) Explain Sky wave propagation.

5. Attempt **any two** : **12**

   a) With suitable circuit diagram explain a frequency modulation of a crystal oscillator with a varactor diode.

   b) Derive an expression for noise equivalent resistance due to cascading of many amplifiers.

   c) With suitable diagram explain telephone transmitter and receiver.

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SLR-TJ – 144

Seat No.	

Set Q

S.E. (Electronics Engineering) (New CBCS) (Part – I) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 21-12-2017 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****.*
4) ***All*** *questions are* ***compulsory****.*
5) Figures to the ***right*** *indicates* ***full*** *marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer :

1) In PM, the frequency deviation is proportional to
   a) only modulating frequency
   b) both amplitude and frequency
   c) only amplitude of modulating sigma
   d) antenna height

2) Which of the following statement is not valid for Amstong modulation system ?
   a) the system is basically PM not FM
   b) AFC is not needed as a crystal oscillator is used
   c) frequency multiplication must be used
   d) equalization is unnecessary

3) Broadcasting antenna are generally
   a) omni directional antenna b) vertical type
   c) horizontal type d) all of these

4) During day time, the ionosphere consists of
   a) D, E, F layers b) D, E, F_1 layers
   c) D, E, F_2 layers d) D, E, F_1, F_2 layers

5) The ionosphere plays a significant role in radio wave propagation at
   a) high frequency b) ultra high frequency
   c) microwaves frequencies d) optical frequencies

6) In telephone the frequency of ringing tone is
   a) 33 Hz b) 133 Hz c) 400 Hz d) None

P.T.O.

7) Number of call attempts in a busy hour is called
   a) Busy Hour Call Attempts
   b) Call Completion Rate
   c) Busy Hour Calling Rate
   d) Traffic Intensity

8) In a low level amplitude modulation system, the amplifier following the modulated stage must be
   a) Linear device
   b) Non linear device
   c) Harmonics device
   d) Class C amplifier

9) Thermal noise voltage in a resistor R is given by
   a) $\sqrt{4RkTB}$ b) kTB c) TBk^2 d) None

10) In an amplitude modulated waveform the amplitude of side bands is
   a) Independent of the carrier amplitude
   b) Independent of the modulation index
   c) Carrier amplitude x modulation index
   d) 1/2 carrier amplitude x modulation index

11) An amplitude modulated voltage in volts is given by v = 20 (1 + 0.5 sin 6280 t) sin (6.28 x 106)t. The rms value of the unmodulated carrier voltage in volts is
   a) 20 b) 20/√2 c) 10 d) 10/√2

12) The relation between carrier power and total power in an AM wave is
   a) $P_C = P_T\left(1+\frac{m^2}{4}\right)$
   b) $P_C = P_T\left(1+\frac{m^2}{2}\right)$
   c) $P_T = P_C\left(1+\frac{m^2}{4}\right)$
   d) $P_T = P_C\left(1+\frac{m^2}{2}\right)$

13) In superhetrodyne receiver the frequency of local oscillator is
   a) higher than the incoming signal frequency
   b) lower than the incoming signal frequency
   c) equal to the incoming signal frequency
   d) none of above

14) In a radio receiver with simple AGC
   a) the highest AGC voltage is produced between stations
   b) an increase signal strength produces more AGC
   c) audio stage gain is normally controlled by the AGC
   d) the faster the AGC time constant, the more accurate the output

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SLR-TJ – 144

Seat No.	

S.E. (Electronics Engineering) (New CBCS) (Part – I) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 21-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any four** : **16**

a) Why modulation is required ?

b) What are the different types of communication channels ?

c) Explain Negative feedback Circuitry.

d) Draw and explain superhetrodyne receiver.

e) Define Bandwidth. The resonant frequency of RF amplifier of a receiver is a 1 MHz and its bandwidth is 10 KHz. What is the Q Factor ?

3. Solve **any two** : **12**

a) The output voltage of a transmitter is given by 400(1 + 0.4 sin 6280 t) sin 3.14 x 107 t. this voltage is fed to a load of 600 Ω resistance.
Determine : i) Carrier frequency
ii) Modulating frequency
iii) Carrier power
iv) Total power output
v) Peak power output.

b) Comparison between DSB, SSB, ISB and VSB with different parameters.

c) Draw and explain TRF radio receiver. Discuss its advantages and disadvantages.

SECTION – II

4. Attempt **any four** : **16**

   a) The carrier swing of a frequency modulated signal is 70 KHz and the modulating signal is a 7 KHz sine wave determine the modulation index of the FM signal.

   b) Explain pre-emphasis and de emphasis in brief.

   c) Explain in brief pulsed dialing and DTMF.

   d) Define characteristics of antenna.

   e) Explain Sky wave propagation.

5. Attempt **any two** : **12**

   a) With suitable circuit diagram explain a frequency modulation of a crystal oscillator with a varactor diode.

   b) Derive an expression for noise equivalent resistance due to cascading of many amplifiers.

   c) With suitable diagram explain telephone transmitter and receiver.

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SLR-TJ – 144

Seat No.	

Set R

S.E. (Electronics Engineering) (New CBCS) (Part – I) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 21-12-2017 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****.*
4) ***All*** *questions are* ***compulsory****.*
5) Figures to the ***right*** *indicates* ***full*** *marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer :

1) The relation between carrier power and total power in an AM wave is

a) $P_C = P_T\left(1+\frac{m^2}{4}\right)$ b) $P_C = P_T\left(1+\frac{m^2}{2}\right)$

c) $P_T = P_C\left(1+\frac{m^2}{4}\right)$ d) $P_T = P_C\left(1+\frac{m^2}{2}\right)$

2) In superhetrodyne receiver the frequency of local oscillator is
   a) higher than the incoming signal frequency
   b) lower than the incoming signal frequency
   c) equal to the incoming signal frequency
   d) none of above

3) In a radio receiver with simple AGC
   a) the highest AGC voltage is produced between stations
   b) an increase signal strength produces more AGC
   c) audio stage gain is normally controlled by the AGC
   d) the faster the AGC time constant, the more accurate the output

4) In PM, the frequency deviation is proportional to
   a) only modulating frequency
   b) both amplitude and frequency
   c) only amplitude of modulating sigma
   d) antenna height

5) Which of the following statement is not valid for Amstong modulation system ?
   a) the system is basically PM not FM
   b) AFC is not needed as a crystal oscillator is used
   c) frequency multiplication must be used
   d) equalization is unnecessary

6) Broadcasting antenna are generally
   a) omni directional antenna b) vertical type
   c) horizontal type d) all of these

7) During day time, the ionosphere consists of
   a) D, E, F layers b) D, E, F_1 layers
   c) D, E, F_2 layers d) D, E, F_1, F_2 layers

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   a) high frequency b) ultra high frequency
   c) microwaves frequencies d) optical frequencies

9) In telephone the frequency of ringing tone is
   a) 33 Hz b) 133 Hz c) 400 Hz d) None

10) Number of call attempts in a busy hour is called
   a) Busy Hour Call Attempts b) Call Completion Rate
   c) Busy Hour Calling Rate d) Traffic Intensity

11) In a low level amplitude modulation system, the amplifier following the modulated stage must be
   a) Linear device b) Non linear device
   c) Harmonics device d) Class C amplifier

12) Thermal noise voltage in a resistor R is given by
   a) $\sqrt{4RkTB}$ b) kTB c) TBk^2 d) None

13) In an amplitude modulated waveform the amplitude of side bands is
   a) Independent of the carrier amplitude
   b) Independent of the modulation index
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   d) 1/2 carrier amplitude x modulation index

14) An amplitude modulated voltage in volts is given by $v = 20 (1 + 0.5 \sin 6280 t) \sin (6.28 \times 106)t$. The rms value of the unmodulated carrier voltage in volts is
   a) 20 b) $20/\sqrt{2}$ c) 10 d) $10/\sqrt{2}$

———————

SLR-TJ – 144

Seat No.	

S.E. (Electronics Engineering) (New CBCS) (Part – I) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 21-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any four** : **16**

a) Why modulation is required ?

b) What are the different types of communication channels ?

c) Explain Negative feedback Circuitry.

d) Draw and explain superhetrodyne receiver.

e) Define Bandwidth. The resonant frequency of RF amplifier of a receiver is a 1 MHz and its bandwidth is 10 KHz. What is the Q Factor ?

3. Solve **any two** : **12**

a) The output voltage of a transmitter is given by 400(1 + 0.4 sin 6280 t) sin 3.14 x 107 t. this voltage is fed to a load of 600 Ω resistance.
Determine : i) Carrier frequency
ii) Modulating frequency
iii) Carrier power
iv) Total power output
v) Peak power output.

b) Comparison between DSB, SSB, ISB and VSB with different parameters.

c) Draw and explain TRF radio receiver. Discuss its advantages and disadvantages.

SECTION – II

4. Attempt **any four** : **16**

   a) The carrier swing of a frequency modulated signal is 70 KHz and the modulating signal is a 7 KHz sine wave determine the modulation index of the FM signal.

   b) Explain pre-emphasis and de emphasis in brief.

   c) Explain in brief pulsed dialing and DTMF.

   d) Define characteristics of antenna.

   e) Explain Sky wave propagation.

5. Attempt **any two** : **12**

   a) With suitable circuit diagram explain a frequency modulation of a crystal oscillator with a varactor diode.

   b) Derive an expression for noise equivalent resistance due to cascading of many amplifiers.

   c) With suitable diagram explain telephone transmitter and receiver.

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SLR-TJ – 144

Seat No.	

Set S

S.E. (Electronics Engineering) (New CBCS) (Part – I) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 21-12-2017 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.*
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4) ***All*** *questions are* ***compulsory****.*
5) Figures to the ***right*** *indicates* ***full*** *marks.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer :

1) Broadcasting antenna are generally
   a) omni directional antenna b) vertical type
   c) horizontal type d) all of these

2) During day time, the ionosphere consists of
   a) D, E, F layers b) D, E, F_1 layers
   c) D, E, F_2 layers d) D, E, F_1, F_2 layers

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   a) high frequency b) ultra high frequency
   c) microwaves frequencies d) optical frequencies

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   a) 33 Hz b) 133 Hz c) 400 Hz d) None

5) Number of call attempts in a busy hour is called
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6) In a low level amplitude modulation system, the amplifier following the modulated stage must be
   a) Linear device b) Non linear device
   c) Harmonics device d) Class C amplifier

7) Thermal noise voltage in a resistor R is given by
   a) $\sqrt{4RkTB}$ b) kTB c) TBk^2 d) None

8) In an amplitude modulated waveform the amplitude of side bands is
   a) Independent of the carrier amplitude
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9) An amplitude modulated voltage in volts is given by v = 20 (1 + 0.5 sin 6280 t) sin (6.28 x 106)t. The rms value of the unmodulated carrier voltage in volts is
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10) The relation between carrier power and total power in an AM wave is

   a) $P_C = P_T\left(1+\frac{m^2}{4}\right)$ b) $P_C = P_T\left(1+\frac{m^2}{2}\right)$

   c) $P_T = P_C\left(1+\frac{m^2}{4}\right)$ d) $P_T = P_C\left(1+\frac{m^2}{2}\right)$

11) In superhetrodyne receiver the frequency of local oscillator is
   a) higher than the incoming signal frequency
   b) lower than the incoming signal frequency
   c) equal to the incoming signal frequency
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12) In a radio receiver with simple AGC
   a) the highest AGC voltage is produced between stations
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   b) both amplitude and frequency
   c) only amplitude of modulating sigma
   d) antenna height

14) Which of the following statement is not valid for Amstong modulation system ?
   a) the system is basically PM not FM
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   c) frequency multiplication must be used
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———————

SLR-TJ – 144

Seat No.	

S.E. (Electronics Engineering) (New CBCS) (Part – I) Examination, 2017
ANALOG COMMUNICATION

Day and Date : Thursday, 21-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

2. Attempt **any four** : **16**

a) Why modulation is required ?

b) What are the different types of communication channels ?

c) Explain Negative feedback Circuitry.

d) Draw and explain superhetrodyne receiver.

e) Define Bandwidth. The resonant frequency of RF amplifier of a receiver is a 1 MHz and its bandwidth is 10 KHz. What is the Q Factor ?

3. Solve **any two** : **12**

a) The output voltage of a transmitter is given by 400(1 + 0.4 sin 6280 t) sin 3.14 x 107 t. this voltage is fed to a load of 600 Ω resistance.
Determine : i) Carrier frequency
ii) Modulating frequency
iii) Carrier power
iv) Total power output
v) Peak power output.

b) Comparison between DSB, SSB, ISB and VSB with different parameters.

c) Draw and explain TRF radio receiver. Discuss its advantages and disadvantages.

SECTION – II

4. Attempt **any four** : **16**

   a) The carrier swing of a frequency modulated signal is 70 KHz and the modulating signal is a 7 KHz sine wave determine the modulation index of the FM signal.

   b) Explain pre-emphasis and de emphasis in brief.

   c) Explain in brief pulsed dialing and DTMF.

   d) Define characteristics of antenna.

   e) Explain Sky wave propagation.

5. Attempt **any two** : **12**

   a) With suitable circuit diagram explain a frequency modulation of a crystal oscillator with a varactor diode.

   b) Derive an expression for noise equivalent resistance due to cascading of many amplifiers.

   c) With suitable diagram explain telephone transmitter and receiver.

———————

SLR-TJ – 145

Seat No.	

Set P

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

Day and Date : Tuesday, 12-12-2017 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 on Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
2) ***Answer MCQ/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 ***right*** *indicate* ***full*** *marks.*
4) Use of calculator is ***allowed****.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The particular integral of differential equation $(4D^2 - 1)y = e^{\frac{x}{2}}$ is

a) $\frac{x}{2}e^{x/2}$ b) $\frac{x}{4}e^{x/2}$ c) $\frac{x}{8}e^{x/2}$ d) $\frac{1}{4}e^{x/2}$

2) The solution of partial differential equation $q = 2p^2$ is

a) $z = ax + 2a^2y + c$ b) $z = 2ax + a^2y + c$

c) $z = 2a^2x + by$ d) $z = ax + \frac{a^2}{2}y + c$

3) The complementary function of the differential equation $(D^3 - D)y = 0$ is

a) $y_c = c_1 + c_2 e^x$ b) $y_c = (c_1 + c_2x + c_3x^2) e^x$
c) $y_c = c_1 + c_2 e^x + c_3 e^{-x}$ d) $y_c = c_2 e^x + c_3 e^{-x}$

4) $L^{-1}\{1\}$ =

a) $\frac{1}{s}$ b) u(t) c) u(t – 1) d) $\delta(t)$

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

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

6) If $L\{f(t)\} = \frac{1}{\sqrt{s^2 + 1}}$, then L {f(3t)} =

a) $\frac{3}{\sqrt{s^2 + 9}}$ b) $\frac{3}{\sqrt{s^2 + 1}}$ c) $\frac{1}{3\sqrt{s^2 + 9}}$ d) $\frac{1}{\sqrt{s^2 + 9}}$

P.T.O.

7) $L\{e^{-t}\, t\} =$

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

8) The unit tangent vector to the curve $x = t^2 + 1$, $y = 4t - 3$, $z = 3t^2 - 6t$ at $t = 1$ is

a) $\frac{1}{\sqrt{3}}(i + j + k)$ b) $\frac{1}{\sqrt{6}}(i + 2j + k)$ c) $\frac{1}{\sqrt{5}}(i + 2j)$ d) $\frac{1}{\sqrt{5}}(i + 2k)$

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

a) 0 b) 1 c) –1 d) 2

10) The inverse Z-transform of $\frac{z}{z-1}, |z| > 1$ is

a) – 1 b) 1 c) 0 d) k

11) The Fourier cosine transform of $f(x) = \begin{cases} 1, & 0 \le x \le 1 \\ 0, & x > 1 \end{cases}$ is

a) $\sqrt{\frac{2}{\pi}}\, s$ b) $\sqrt{\frac{2}{\pi}} \sin s$

c) $\sqrt{\frac{2}{\pi}} \frac{\sin s}{s}$ d) $\sqrt{\frac{2}{\pi}} \frac{\cos s}{s}$

12) The Fourier sine integral form of f(x) is

a) $\int_0^\infty f(s) \sin \omega s\, ds$ b) $\int_0^\infty \sin \omega x \left\{ \int_0^\infty f(\omega) \sin \omega s\, ds \right\} dw$

c) $\frac{2}{\pi} \int_0^\infty \sin \omega x \left\{ \int_0^\infty f(s) \sin \omega s\, ds \right\} dw$ d) none of these

13) The conditions for expansion of a function in a Fourier series are known as

a) Harmonic b) Riemann c) Periodic d) Dirichlet's

14) If $f(x) = x$ is represented by Fourier series in $(-\pi, \pi)$ then _____ is the constant term.

a) $\frac{\pi}{2}$ b) π c) 0 d) 2π

SLR-TJ – 145

Seat No.	

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

Day and Date : Tuesday, 12-12-2017 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 **right** indicate **full** marks.*
*3) **Use** of calculator is **allowed**.*

SECTION – I

2. Attempt the following :

a) Solve : $(D^3 - 2D^2 + 4D)y = e^{2x} + \sin(2x)$. **3**

b) Solve : $(D^2 + 2D + 1)y = 4e^{-x} \log(x)$. **3**

c) Solve : $(D^2 + D)y = x^2 + 2x$. **3**

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

a) $p^3 + q^3 = 3pq\,z$

b) $x(1 + y)p - y(1 + x)q = 0$

c) $z^2(p^2x^2 + q^2) = 1$

d) $\left(\frac{1}{z} - \frac{1}{y}\right)p + \left(\frac{1}{x} - \frac{1}{z}\right)q = \frac{1}{y} - \frac{1}{x}$

4. Attempt the following :

a) Find $L\{e^{-2t} + 4t^3 - \sin 2t \cdot \cos 3t\}$. **3**

b) Find $L\{e^{-4t} \int_0^t t \sin 3t\, dt\}$. **3**

c) Find the Laplace transform of periodic function f(t) given by

$f(t) = t \;;\; 0 < t < \pi$

$= \pi - t \;;\; \pi < t < 2\pi$ **4**

Where $f(t + 2\pi) = f(t)$.

OR

Set P

c) Evaluate the following integral by using Laplace transform method. **4**

$$\int_0^{\infty} e^{-t}\left(\frac{\sin^2 t}{t}\right)dt$$

5. Attempt the following :

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

b) Using convolution theorem, find inverse Laplace transform of $\frac{s^2}{(s^2+4)^2}$. **3**

c) Solve the following differential equation by Laplace transform

$y'' + 4y = \delta(t)$

with $y(0) = 0$, $y'(0) = 0$, where $\delta(t)$ is unit impulse function. **3**

SECTION – II

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

a) Find $z^{-1}\left\{\frac{1}{(z-5)^3}\right\}$, $|z| < 5$.

b) Find $z\{\cos \alpha k\}$, $k \geq 0$.

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

d) Find $z\left\{\frac{\alpha^k}{k}\right\}$, $k \geq 1$.

7. a) Find the tangential and normal components of acceleration of particle moving on the curve $x = t^3 - 4t$, $y = t^2 + 4t$, $z = 8t^2 - 3t^3$ at $t = 2$. **4**

b) Prove that $\nabla\frac{1}{r} = -\frac{\bar{r}}{r^3}$. **3**

c) Determine the constant a, so that the vector $\bar{F} = (x+3y^2)i + (2y+2z^2)j + (x^2+az)k$ is solenoidal. **3**

8. a) Find the Fourier series for f(x) in $(0, 2\pi)$ **5**

$$f(x) = \begin{cases} x & ; \ 0 < x \leq \pi \\ 2\pi - x & ; \ \pi < x < 2\pi \end{cases}$$

b) Obtain Fourier series for $f(x) = x^2 - 2$, $-2 \leq x \leq 2$ **4**

OR

b) Find half range sine series for $f(x) = \begin{cases} x & , \quad 0 < x \leq \pi/2 \\ \pi - x & , \quad \pi/2 < x < \pi \end{cases}$ **4**

9. a) Using Fourier cosine integral $(x \geq 0)$, prove that $e^{-x} = \frac{2}{\pi} \int_0^\infty \frac{\cos \omega x}{1+\omega^2} dw$. **3**

b) Express the function $f(x) = \begin{cases} 1, & \text{for } |x| < 1 \\ 0, & \text{for } |x| > 1 \end{cases}$ as Fourier intergral. Hence evaluate

$\int_0^\infty \frac{\sin \omega \cos \omega x}{\omega} dw$. **3**

c) Express the function $f(x) = \begin{cases} \sin x, & 0 \leq x < \pi \\ 0, & x > \pi \end{cases}$ as a Fourier sine integral and evaluate

$\int_0^\infty \frac{\sin \omega x \sin \pi\omega}{1-\omega^2} dw$. **3**

Set P

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Seat No.	

Set Q

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

Day and Date : Tuesday, 12-12-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

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4) Use of calculator is ***allowed****.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The unit tangent vector to the curve $x = t^2 + 1$, $y = 4t - 3$, $z = 3t^2 - 6t$ at $t = 1$ is

a) $\frac{1}{\sqrt{3}}(i + j + k)$ b) $\frac{1}{\sqrt{6}}(i + 2j + k)$ c) $\frac{1}{\sqrt{5}}(i + 2j)$ d) $\frac{1}{\sqrt{5}}(i + 2k)$

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

a) 0 b) 1 c) –1 d) 2

3) The inverse Z-transform of $\frac{z}{z-1}$, $|z| > 1$ is

a) – 1 b) 1 c) 0 d) k

4) The Fourier cosine transform of $f(x) = \begin{cases} 1, & 0 \le x \le 1 \\ 0, & x > 1 \end{cases}$ is

a) $\sqrt{\frac{2}{\pi}}\, s$ b) $\sqrt{\frac{2}{\pi}} \sin s$

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5) The Fourier sine integral form of f(x) is

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P.T.O.

6) The conditions for expansion of a function in a Fourier series are known as
   a) Harmonic b) Riemann c) Periodic d) Dirichlet's

7) If f(x) = x is represented by Fourier series in $(-\pi, \pi)$ then _____ is the constant term.
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8) The particular integral of differential equation $(4D^2 - 1)y = e^{\frac{x}{2}}$ is
   a) $\frac{x}{2}e^{x/2}$ b) $\frac{x}{4}e^{x/2}$ c) $\frac{x}{8}e^{x/2}$ d) $\frac{1}{4}e^{x/2}$

9) The solution of partial differential equation $q = 2p^2$ is
   a) $z = ax + 2a^2y + c$ b) $z = 2ax + a^2y + c$
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_____

SLR-TJ – 145

Seat No.	

Set **Q**

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

Day and Date : Tuesday, 12-12-2017 Marks : 56

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

N.B. : *1) Attempt **any three** questions from **each** Section.*
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SECTION – I

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Where $f(t + 2\pi) = f(t)$.

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c) Evaluate the following integral by using Laplace transform method. **4**

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with $y(0) = 0$, $y'(0) = 0$, where $\delta(t)$ is unit impulse function. **3**

SECTION – II

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b) Prove that $\nabla\frac{1}{r} = -\frac{\bar{r}}{r^3}$. **3**

c) Determine the constant a, so that the vector $\bar{F} = (x + 3y^2)i + (2y + 2z^2)j + (x^2 + az)k$ is solenoidal. **3**

Set Q

8. a) Find the Fourier series for f(x) in $(0, 2\pi)$ **5**

$$f(x) = \begin{cases} x & ; \ 0 < x \leq \pi \\ 2\pi - x & ; \ \pi < x < 2\pi \end{cases}$$

b) Obtain Fourier series for $f(x) = x^2 - 2$, $-2 \leq x \leq 2$ **4**

OR

b) Find half range sine series for $f(x) = \begin{cases} x & , \quad 0 < x \leq \pi/2 \\ \pi - x & , \quad \pi/2 < x < \pi \end{cases}$ **4**

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b) Express the function $f(x) = \begin{cases} 1, & \text{for } |x| < 1 \\ 0, & \text{for } |x| > 1 \end{cases}$ as Fourier intergral. Hence evaluate

$\int_0^\infty \frac{\sin \omega \cos \omega x}{\omega} dw$. **3**

c) Express the function $f(x) = \begin{cases} \sin x & , 0 \leq x < \pi \\ 0 & , \ x > \pi \end{cases}$ as a Fourier sine integral and evaluate

$\int_0^\infty \frac{\sin \omega x \sin \pi\omega}{1-\omega^2} dw$. **3**

Set Q

Set Q

SLR-TJ – 145

Seat No.	

Set R

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

Day and Date : Tuesday, 12-12-2017 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 on Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

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

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

2) If $L\{f(t)\} = \frac{1}{\sqrt{s^2+1}}$, then L {f(3t)} =

a) $\frac{3}{\sqrt{s^2+9}}$ b) $\frac{3}{\sqrt{s^2+1}}$ c) $\frac{1}{3\sqrt{s^2+9}}$ d) $\frac{1}{\sqrt{s^2+9}}$

3) $L\{e^{-t}t\} =$

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

4) The unit tangent vector to the curve $x = t^2 + 1$, $y = 4t - 3$, $z = 3t^2 - 6t$ at $t = 1$ is

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

a) 0 b) 1 c) –1 d) 2

6) The inverse Z-transform of $\frac{z}{z-1}$, $|z| > 1$ is

a) – 1 b) 1 c) 0 d) k

P.T.O.

7) The Fourier cosine transform of $f(x) = \begin{cases} 1, & 0 \le x \le 1 \\ 0, & x > 1 \end{cases}$ is

a) $\sqrt{\frac{2}{\pi}}\, s$ b) $\sqrt{\frac{2}{\pi}} \sin s$

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9) The conditions for expansion of a function in a Fourier series are known as

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a) $y_c = c_1 + c_2 e^x$ b) $y_c = (c_1 + c_2x + c_3x^2) e^x$

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14) $L^{-1}\{1\}$ =

a) $\frac{1}{s}$ b) u(t) c) u(t – 1) d) $\delta(t)$

Set R

SLR-TJ – 145

Seat No.	

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

Day and Date : Tuesday, 12-12-2017 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 **right** indicate **full** marks.*
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SECTION – I

2. Attempt the following :

a) Solve : $(D^3 - 2D^2 + 4D)y = e^{2x} + \sin(2x)$. **3**

b) Solve : $(D^2 + 2D + 1)y = 4e^{-x} \log(x)$. **3**

c) Solve : $(D^2 + D)y = x^2 + 2x$. **3**

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

a) $p^3 + q^3 = 3pq\,z$

b) $x(1 + y)p - y(1 + x)q = 0$

c) $z^2(p^2x^2 + q^2) = 1$

d) $\left(\frac{1}{z} - \frac{1}{y}\right)p + \left(\frac{1}{x} - \frac{1}{z}\right)q = \frac{1}{y} - \frac{1}{x}$

4. Attempt the following :

a) Find $L\{e^{-2t} + 4t^3 - \sin 2t \cdot \cos 3t\}$. **3**

b) Find $L\{e^{-4t} \int_0^t t \sin 3t\, dt\}$. **3**

c) Find the Laplace transform of periodic function f(t) given by

$f(t) = t \;;\; 0 < t < \pi$

$= \pi - t \;;\; \pi < t < 2\pi$ **4**

Where $f(t + 2\pi) = f(t)$.

OR

Set R

c) Evaluate the following integral by using Laplace transform method. **4**

$$\int_0^{\infty} e^{-t}\left(\frac{\sin^2 t}{t}\right)dt$$

5. Attempt the following :

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

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c) Solve the following differential equation by Laplace transform

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with $y(0) = 0,\ y'(0) = 0$, where $\delta(t)$ is unit impulse function. **3**

SECTION – II

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

a) Find $z^{-1}\left\{\frac{1}{(z-5)^3}\right\}, \quad |z| < 5$.

b) Find $z\{\cos \alpha k\}, \quad k \geq 0$.

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

d) Find $z\left\{\frac{\alpha^k}{k}\right\}, \quad k \geq 1$.

7. a) Find the tangential and normal components of acceleration of particle moving on the curve $x = t^3 - 4t,\ y = t^2 + 4t,\ z = 8t^2 - 3t^3$ at $t = 2$. **4**

b) Prove that $\nabla\frac{1}{r} = -\frac{\bar{r}}{r^3}$. **3**

c) Determine the constant a, so that the vector $\bar{F} = (x + 3y^2)i + (2y + 2z^2)j + (x^2 + az)k$ is solenoidal. **3**

Set R

8. a) Find the Fourier series for f(x) in $(0, 2\pi)$ **5**

$$f(x) = \begin{cases} x & ; \ 0 < x \leq \pi \\ 2\pi - x & ; \ \pi < x < 2\pi \end{cases}$$

b) Obtain Fourier series for $f(x) = x^2 - 2$, $-2 \leq x \leq 2$ **4**

OR

b) Find half range sine series for $f(x) = \begin{cases} x & , \quad 0 < x \leq \pi/2 \\ \pi - x & , \quad \pi/2 < x < \pi \end{cases}$ **4**

9. a) Using Fourier cosine integral $(x \geq 0)$, prove that $e^{-x} = \frac{2}{\pi} \int_0^\infty \frac{\cos \omega x}{1+\omega^2} dw$. **3**

b) Express the function $f(x) = \begin{cases} 1, & \text{for } |x| < 1 \\ 0, & \text{for } |x| > 1 \end{cases}$ as Fourier intergral. Hence evaluate

$\int_0^\infty \frac{\sin \omega \cos \omega x}{\omega} dw$. **3**

c) Express the function $f(x) = \begin{cases} \sin x & , 0 \leq x < \pi \\ 0 & , \ x > \pi \end{cases}$ as a Fourier sine integral and evaluate

$\int_0^\infty \frac{\sin \omega x \sin \pi\omega}{1-\omega^2} dw$. **3**

Set R

SLR-TJ – 145

Seat No.	

Set S

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

Day and Date : Tuesday, 12-12-2017 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 on Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
2) ***Answer MCQ/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 ***right*** *indicate* ***full*** *marks.*
4) Use of calculator is ***allowed****.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The inverse Z-transform of $\frac{z}{z-1}$, $|z|>1$ is

a) -1 b) 1 c) 0 d) k

2) The Fourier cosine transform of $f(x) = \begin{cases} 1, & 0 \le x \le 1 \\ 0, & x > 1 \end{cases}$ is

a) $\sqrt{\frac{2}{\pi}}\, s$ b) $\sqrt{\frac{2}{\pi}} \sin s$

c) $\sqrt{\frac{2}{\pi}} \frac{\sin s}{s}$ d) $\sqrt{\frac{2}{\pi}} \frac{\cos s}{s}$

3) The Fourier sine integral form of f(x) is

a) $\int_0^\infty f(s) \sin \omega s ds$ b) $\int_0^\infty \sin \omega x \left\{ \int_0^\infty f(\omega) \sin \omega s ds \right\} dw$

c) $\frac{2}{\pi} \int_0^\infty \sin \omega x \left\{ \int_0^\infty f(s) \sin \omega s ds \right\} dw$ d) none of these

4) The conditions for expansion of a function in a Fourier series are known as
a) Harmonic b) Riemann c) Periodic d) Dirichlet's

5) If f(x) = x is represented by Fourier series in $(-\pi, \pi)$ then _____ is the constant term.

a) $\frac{\pi}{2}$ b) π c) 0 d) 2π

P.T.O.

6) The particular integral of differential equation $(4D^2 - 1)y = e^{\frac{x}{2}}$ is

a) $\frac{x}{2}e^{x/2}$ b) $\frac{x}{4}e^{x/2}$ c) $\frac{x}{8}e^{x/2}$ d) $\frac{1}{4}e^{x/2}$

7) The solution of partial differential equation $q = 2p^2$ is

a) $z = ax + 2a^2y + c$ b) $z = 2ax + a^2y + c$

c) $z = 2a^2x + by$ d) $z = ax + \frac{a^2}{2}y + c$

8) The complementary function of the differential equation $(D^3 - D)y = 0$ is

a) $y_c = c_1 + c_2 e^x$ b) $y_c = (c_1 + c_2x + c_3x^2) e^x$

c) $y_c = c_1 + c_2 e^x + c_3 e^{-x}$ d) $y_c = c_2 e^x + c_3 e^{-x}$

9) $L^{-1}\{1\} =$

a) $\frac{1}{s}$ b) $u(t)$ c) $u(t-1)$ d) $\delta(t)$

10) $L^{-1}\left\{\frac{s}{4s^2 - 9}\right\} =$

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

11) If $L\{f(t)\} = \frac{1}{\sqrt{s^2 + 1}}$, then $L\{f(3t)\} =$

a) $\frac{3}{\sqrt{s^2 + 9}}$ b) $\frac{3}{\sqrt{s^2 + 1}}$ c) $\frac{1}{3\sqrt{s^2 + 9}}$ d) $\frac{1}{\sqrt{s^2 + 9}}$

12) $L\{e^{-t}\, t\} =$

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

13) The unit tangent vector to the curve $x = t^2 + 1$, $y = 4t - 3$, $z = 3t^2 - 6t$ at $t = 1$ is

a) $\frac{1}{\sqrt{3}}(i + j + k)$ b) $\frac{1}{\sqrt{6}}(i + 2j + k)$ c) $\frac{1}{\sqrt{5}}(i + 2j)$ d) $\frac{1}{\sqrt{5}}(i + 2k)$

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

a) 0 b) 1 c) –1 d) 2

SLR-TJ – 145

Seat No.	

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

Day and Date : Tuesday, 12-12-2017 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 **right** indicate **full** marks.*
*3) **Use** of calculator is **allowed**.*

SECTION – I

2. Attempt the following :

a) Solve : $(D^3 - 2D^2 + 4D)y = e^{2x} + \sin(2x)$. **3**

b) Solve : $(D^2 + 2D + 1)y = 4e^{-x} \log(x)$. **3**

c) Solve : $(D^2 + D)y = x^2 + 2x$. **3**

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

a) $p^3 + q^3 = 3pq\,z$

b) $x(1 + y)p - y(1 + x)q = 0$

c) $z^2(p^2x^2 + q^2) = 1$

d) $\left(\frac{1}{z} - \frac{1}{y}\right)p + \left(\frac{1}{x} - \frac{1}{z}\right)q = \frac{1}{y} - \frac{1}{x}$

4. Attempt the following :

a) Find $L\{e^{-2t} + 4t^3 - \sin 2t \cdot \cos 3t\}$. **3**

b) Find $L\{e^{-4t} \int_0^t t \sin 3t\, dt\}$. **3**

c) Find the Laplace transform of periodic function f(t) given by

$f(t) = t \;;\; 0 < t < \pi$

$= \pi - t \;;\; \pi < t < 2\pi$ **4**

Where $f(t + 2\pi) = f(t)$.

OR

c) Evaluate the following integral by using Laplace transform method. **4**

$$\int_0^{\infty} e^{-t}\left(\frac{\sin^2 t}{t}\right)dt$$

5. Attempt the following :

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

b) Using convolution theorem, find inverse Laplace transform of $\frac{s^2}{(s^2+4)^2}$. **3**

c) Solve the following differential equation by Laplace transform

$y'' + 4y = \delta(t)$

with $y(0) = 0$, $y'(0) = 0$, where $\delta(t)$ is unit impulse function. **3**

SECTION – II

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

a) Find $z^{-1}\left\{\frac{1}{(z-5)^3}\right\}$, $|z| < 5$.

b) Find $z\{\cos \alpha k\}$, $k \geq 0$.

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

d) Find $z\left\{\frac{\alpha^k}{k}\right\}$, $k \geq 1$.

7. a) Find the tangential and normal components of acceleration of particle moving on the curve $x = t^3 - 4t$, $y = t^2 + 4t$, $z = 8t^2 - 3t^3$ at $t = 2$. **4**

b) Prove that $\nabla\frac{1}{r} = -\frac{\bar{r}}{r^3}$. **3**

c) Determine the constant a, so that the vector $\bar{F} = (x + 3y^2)i + (2y + 2z^2)j + (x^2 + az)k$ is solenoidal. **3**

8. a) Find the Fourier series for f(x) in $(0, 2\pi)$ **5**

$$f(x) = \begin{cases} x & ; \ 0 < x \leq \pi \\ 2\pi - x & ; \ \pi < x < 2\pi \end{cases}$$

b) Obtain Fourier series for $f(x) = x^2 - 2$, $-2 \leq x \leq 2$ **4**

OR

b) Find half range sine series for $f(x) = \begin{cases} x & , \quad 0 < x \leq \pi/2 \\ \pi - x & , \quad \pi/2 < x < \pi \end{cases}$ **4**

9. a) Using Fourier cosine integral $(x \geq 0)$, prove that $e^{-x} = \frac{2}{\pi} \int_0^\infty \frac{\cos \omega x}{1+\omega^2} dw$. **3**

b) Express the function $f(x) = \begin{cases} 1, & \text{for } |x| < 1 \\ 0, & \text{for } |x| > 1 \end{cases}$ as Fourier intergral. Hence evaluate

$\int_0^\infty \frac{\sin \omega \cos \omega x}{\omega} dw$. **3**

c) Express the function $f(x) = \begin{cases} \sin x \ , 0 \leq x < \pi \\ 0 \quad , \ x > \pi \end{cases}$ as a Fourier sine integral and evaluate

$\int_0^\infty \frac{\sin \omega x \sin \pi\omega}{1-\omega^2} dw$. **3**

Set S

SLR-TJ – 146

Seat No.	

Set P

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

Day and Date : Thursday, 14-12-2017 Total 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 :

1) A zener diode is
   a) Acts as regulator in forward bias
   b) Acts as voltage regulator after reverse breakdown
   c) A very fast photo diode
   d) Introduce dc voltage depends upon thermally generated minority carriers

2) If one of the diode in bridge rectifier opens, then output is
   a) 0 V b) $Vm/2\pi$
   c) Full wave rectified voltage d) Half wave rectified voltage

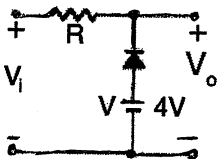
3) The ripple frequency of full wave voltage doubler circuit is
   a) Equal to input frequency b) Double the input frequency
   c) Half the input frequency d) Independent of input frequency

4) The capacitance which exists in a forward biased junction is _____ capacitance.
   a) Diffusion b) Barrier
   c) Space charge region d) Junction

P.T.O.

5) The function of bleeder resistor in power supply is
   a) To provide discharging path for capacitor
   b) It improves regulation characteristics
   c) Both a) and b)
   d) Is same as load resistor

6) The circuit shown is of



   a) Biased series clipper
   b) Biased shunt clipper
   c) Positive clamper
   d) Negative clamper

7) In C.T. full wave rectifier, peak voltage across full secondary winding is 20 V, then PIV for each diode is
   a) 10 V
   b) $20/\sqrt{2}$
   c) 20
   d) 40

8) The magnitude of collector junction reverse bias voltage increases, then effective base width is
   a) Decreases
   b) Increases
   c) Remains constant
   d) First increases and then remains constant

9) Stability factor for _____ is $(1 + \beta)$.
   a) Voltage divider bias
   b) Collector to base bias
   c) Fixed bias
   d) Self bias

10) To operate transistor as a switch operating regions are restricted to
   a) Activity only
   b) Saturation and active
   c) Saturation and cutoff
   d) Cutoff only

11) The EMOSFET and DMOSFET respectively are
   a) Unipolar, Unipolar
   b) Bipolar, Bipolar
   c) Unipolar, Bipolar
   d) Unipolar, Nonpolar

12) For voltage amplification JFET is operated in _____ region.
   a) Ohmic
   b) Cutoff
   c) Pinch-off
   d) Both a) and b)

13) In a monostable multivibrator, quasi stable state duration is
   a) 1.38 RC
   b) 1.4 RC
   c) RC
   d) 0.693 RC

14) In an astable multivibrator has C1 = C2=1000 pF and R1 = R2 = 20 KΩ then frequency of oscillation is
   a) 36.23 KHz
   b) 3.625 KHz
   c) 0.3625 KHz
   d) 362.5 KHz

SLR-TJ – 146

Seat No.	

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

Day and Date : Thursday, 14-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

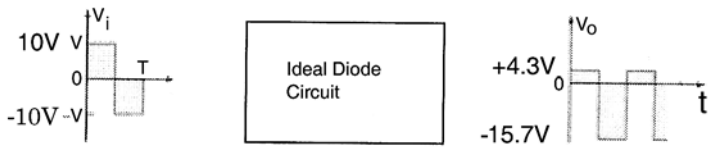
Instructions *: 1)* ***All*** *questions are* ***compulsory***
2) ***Assume*** *suitable data* ***if required****.*
3) Figures to ***right*** *indicate* ***maximum*** *marks.*
4) ***Use*** *of data sheet is* ***allowed****.*

SECTION – I

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

a) What is dynamic resistance of diode ? Derive an expression of dynamic resistance of diode.

b) Design a suitable circuit to perform function indicated.



c) Explain how Zener diode can be used as a voltage regulator.

d) Derive an expression of ripple factor for CLC filter.

e) A full wave rectifier is fed from transformer having centre tapped secondary winding. The rms voltage from either end of secondary to centre tap is 30 V. If diode forward resistance is $2\,\Omega$ and secondary winding resistance is $8\,\Omega$ for load of $1\,K\Omega$. Calculate.

i) Power delivered to load

ii) Rectification efficiency.

3. Attempt **any two** : **(2×6=12)**

   a) What is Clipper ? Explain with suitable circuit diagram, waveforms and transfer characteristics working of biased series positive and biased shunt negative clipper.

   b) With suitable circuit diagram explain operation of voltage doubler and voltage trippler circuit.

   c) Design bridge rectifier circuit with capacitor filter to provide 12V DC and load current of 120 mA and ripple factor of 5%.

SECTION – II

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

   a) Explain effect of emitter bypass capacitor and coupling capacitor on low frequency response.

   b) Explain drain and transfer characteristics of N channel DMOSFET.

   c) 'Q-point at saturation and at cut off results to distortion'. Justify answer with suitable waveforms.

   d) Explain switching characteristics of BJT.

   e) Compare BJT, JFET and MOSFET.

5. Attempt **any two** : **(2×6=12)**

   a) What is stability factor ? Derive expression for stability factor S of voltage divider bias circuit. Explain how it stabilizes the operating point.

   b) Derive the expression for Ai, Ri, Av, Yo in terms of hybrid parameter for CE configuration.

   c) Explain Working of Astable multivibrator and derive an expression for its frequency of oscillation. Sketch associated waveforms.

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Seat No.	

Set **Q**

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

Day and Date : Thursday, 14-12-2017 Total 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 :

1) The magnitude of collector junction reverse bias voltage increases, then effective base width is
   a) Decreases b) Increases
   c) Remains constant d) First increases and then remains constant

2) Stability factor for _____ is $(1 + \beta)$.
   a) Voltage divider bias b) Collector to base bias
   c) Fixed bias d) Self bias

3) To operate transistor as a switch operating regions are restricted to
   a) Activity only b) Saturation and active
   c) Saturation and cutoff d) Cutoff only

4) The EMOSFET and DMOSFET respectively are
   a) Unipolar, Unipolar b) Bipolar, Bipolar
   c) Unipolar, Bipolar d) Unipolar, Nonpolar

5) For voltage amplification JFET is operated in _____ region.
   a) Ohmic b) Cutoff c) Pinch-off d) Both a) and b)

6) In a monostable multivibrator, quasi stable state duration is
   a) 1.38 RC b) 1.4 RC c) RC d) 0.693 RC

7) In an astable multivibrator has C1 = C2=1000 pF and R1 = R2 = 20 KΩ then frequency of oscillation is
   a) 36.23 KHz b) 3.625 KHz c) 0.3625 KHz d) 362.5 KHz

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9) If one of the diode in bridge rectifier opens, then output is
   a) 0 V b) Vm/2π
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11) The capacitance which exists in a forward biased junction is _____ capacitance.
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12) The function of bleeder resistor in power supply is
   a) To provide discharging path for capacitor
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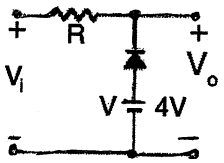
   d) Is same as load resistor

13) The circuit shown is of



   a) Biased series clipper b) Biased shunt clipper
   c) Positive clamper d) Negative clamper

14) In C.T. full wave rectifier, peak voltage across full secondary winding is 20 V, then PIV for each diode is
   a) 10 V b) $20/\sqrt{2}$ c) 20 d) 40

SLR-TJ – 146

Seat No.	

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

Day and Date : Thursday, 14-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

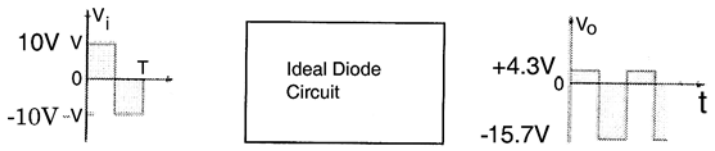
Instructions *: 1)* ***All*** *questions are* ***compulsory***
2) ***Assume*** *suitable data* ***if required****.*
3) Figures to ***right*** *indicate* ***maximum*** *marks.*
4) ***Use*** *of data sheet is* ***allowed****.*

SECTION – I

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

a) What is dynamic resistance of diode ? Derive an expression of dynamic resistance of diode.

b) Design a suitable circuit to perform function indicated.



c) Explain how Zener diode can be used as a voltage regulator.

d) Derive an expression of ripple factor for CLC filter.

e) A full wave rectifier is fed from transformer having centre tapped secondary winding. The rms voltage from either end of secondary to centre tap is 30 V. If diode forward resistance is $2\,\Omega$ and secondary winding resistance is $8\,\Omega$ for load of 1 $K\Omega$. Calculate.

i) Power delivered to load

ii) Rectification efficiency.

3. Attempt **any two** : **(2×6=12)**

   a) What is Clipper ? Explain with suitable circuit diagram, waveforms and transfer characteristics working of biased series positive and biased shunt negative clipper.

   b) With suitable circuit diagram explain operation of voltage doubler and voltage trippler circuit.

   c) Design bridge rectifier circuit with capacitor filter to provide 12V DC and load current of 120 mA and ripple factor of 5%.

SECTION – II

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

   a) Explain effect of emitter bypass capacitor and coupling capacitor on low frequency response.

   b) Explain drain and transfer characteristics of N channel DMOSFET.

   c) 'Q-point at saturation and at cut off results to distortion'. Justify answer with suitable waveforms.

   d) Explain switching characteristics of BJT.

   e) Compare BJT, JFET and MOSFET.

5. Attempt **any two** : **(2×6=12)**

   a) What is stability factor ? Derive expression for stability factor S of voltage divider bias circuit. Explain how it stabilizes the operating point.

   b) Derive the expression for Ai, Ri, Av, Yo in terms of hybrid parameter for CE configuration.

   c) Explain Working of Astable multivibrator and derive an expression for its frequency of oscillation. Sketch associated waveforms.

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SLR-TJ – 146

Seat No.	

Set **R**

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

Day and Date : Thursday, 14-12-2017 Total 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.***

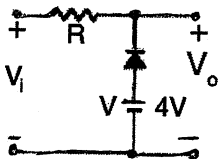
MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer :

1) The function of bleeder resistor in power supply is
   a) To provide discharging path for capacitor
   b) It improves regulation characteristics
   c) Both a) and b)
   d) Is same as load resistor

2) The circuit shown is of



   a) Biased series clipper b) Biased shunt clipper
   c) Positive clamper d) Negative clamper

3) In C.T. full wave rectifier, peak voltage across full secondary winding is 20 V, then PIV for each diode is
   a) 10 V b) $20/\sqrt{2}$ c) 20 d) 40

4) The magnitude of collector junction reverse bias voltage increases, then effective base width is
   a) Decreases b) Increases
   c) Remains constant d) First increases and then remains constant

5) Stability factor for _____ is $(1 + \beta)$.
   a) Voltage divider bias b) Collector to base bias
   c) Fixed bias d) Self bias

6) To operate transistor as a switch operating regions are restricted to
   a) Activity only b) Saturation and active
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7) The EMOSFET and DMOSFET respectively are
   a) Unipolar, Unipolar b) Bipolar, Bipolar
   c) Unipolar, Bipolar d) Unipolar, Nonpolar

8) For voltage amplification JFET is operated in _____ region.
   a) Ohmic b) Cutoff c) Pinch-off d) Both a) and b)

9) In a monostable multivibrator, quasi stable state duration is
   a) 1.38 RC b) 1.4 RC c) RC d) 0.693 RC

10) In an astable multivibrator has C1 = C2=1000 pF and R1 = R2 = 20 KΩ then frequency of oscillation is
   a) 36.23 KHz b) 3.625 KHz c) 0.3625 KHz d) 362.5 KHz

11) A zener diode is
   a) Acts as regulator in forward bias
   b) Acts as voltage regulator after reverse breakdown
   c) A very fast photo diode
   d) Introduce dc voltage depends upon thermally generated minority carriers

12) If one of the diode in bridge rectifier opens, then output is
   a) 0 V b) $Vm/2\pi$
   c) Full wave rectified voltage d) Half wave rectified voltage

13) The ripple frequency of full wave voltage doubler circuit is
   a) Equal to input frequency b) Double the input frequency
   c) Half the input frequency d) Independent of input frequency

14) The capacitance which exists in a forward biased junction is _____ capacitance.
   a) Diffusion b) Barrier
   c) Space charge region d) Junction

SLR-TJ – 146

Seat No.	

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

Day and Date : Thursday, 14-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

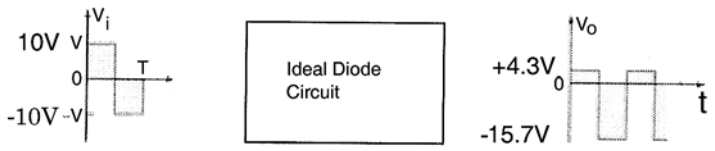
Instructions *: 1)* ***All*** *questions are* ***compulsory***
2) ***Assume*** *suitable data* ***if required****.*
3) Figures to ***right*** *indicate* ***maximum*** *marks.*
4) ***Use*** *of data sheet is* ***allowed****.*

SECTION – I

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

a) What is dynamic resistance of diode ? Derive an expression of dynamic resistance of diode.

b) Design a suitable circuit to perform function indicated.



c) Explain how Zener diode can be used as a voltage regulator.

d) Derive an expression of ripple factor for CLC filter.

e) A full wave rectifier is fed from transformer having centre tapped secondary winding. The rms voltage from either end of secondary to centre tap is 30 V. If diode forward resistance is $2\,\Omega$ and secondary winding resistance is $8\,\Omega$ for load of $1\,K\Omega$. Calculate.

i) Power delivered to load

ii) Rectification efficiency.

3. Attempt **any two** : **(2×6=12)**

   a) What is Clipper ? Explain with suitable circuit diagram, waveforms and transfer characteristics working of biased series positive and biased shunt negative clipper.

   b) With suitable circuit diagram explain operation of voltage doubler and voltage trippler circuit.

   c) Design bridge rectifier circuit with capacitor filter to provide 12V DC and load current of 120 mA and ripple factor of 5%.

SECTION – II

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

   a) Explain effect of emitter bypass capacitor and coupling capacitor on low frequency response.

   b) Explain drain and transfer characteristics of N channel DMOSFET.

   c) 'Q-point at saturation and at cut off results to distortion'. Justify answer with suitable waveforms.

   d) Explain switching characteristics of BJT.

   e) Compare BJT, JFET and MOSFET.

5. Attempt **any two** : **(2×6=12)**

   a) What is stability factor ? Derive expression for stability factor S of voltage divider bias circuit. Explain how it stabilizes the operating point.

   b) Derive the expression for Ai, Ri, Av, Yo in terms of hybrid parameter for CE configuration.

   c) Explain Working of Astable multivibrator and derive an expression for its frequency of oscillation. Sketch associated waveforms.

———————

SLR-TJ – 146

Seat No.	

Set **S**

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

Day and Date : Thursday, 14-12-2017 Total 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 :

1) To operate transistor as a switch operating regions are restricted to
   a) Activity only b) Saturation and active
   c) Saturation and cutoff d) Cutoff only

2) The EMOSFET and DMOSFET respectively are
   a) Unipolar, Unipolar b) Bipolar, Bipolar
   c) Unipolar, Bipolar d) Unipolar, Nonpolar

3) For voltage amplification JFET is operated in _____ region.
   a) Ohmic b) Cutoff c) Pinch-off d) Both a) and b)

4) In a monostable multivibrator, quasi stable state duration is
   a) 1.38 RC b) 1.4 RC c) RC d) 0.693 RC

5) In an astable multivibrator has C1 = C2=1000 pF and R1 = R2 = 20 KΩ then frequency of oscillation is
   a) 36.23 KHz b) 3.625 KHz c) 0.3625 KHz d) 362.5 KHz

P.T.O.

6) A zener diode is
   a) Acts as regulator in forward bias
   b) Acts as voltage regulator after reverse breakdown
   c) A very fast photo diode
   d) Introduce dc voltage depends upon thermally generated minority carriers

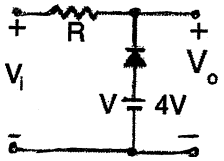
7) If one of the diode in bridge rectifier opens, then output is
   a) 0 V
   b) $Vm/2\pi$
   c) Full wave rectified voltage
   d) Half wave rectified voltage

8) The ripple frequency of full wave voltage doubler circuit is
   a) Equal to input frequency
   b) Double the input frequency
   c) Half the input frequency
   d) Independent of input frequency

9) The capacitance which exists in a forward biased junction is _____ capacitance.
   a) Diffusion
   b) Barrier
   c) Space charge region
   d) Junction

10) The function of bleeder resistor in power supply is
   a) To provide discharging path for capacitor
   b) It improves regulation characteristics
   c) Both a) and b)
   d) Is same as load resistor

11) The circuit shown is of



   a) Biased series clipper
   b) Biased shunt clipper
   c) Positive clamper
   d) Negative clamper

12) In C.T. full wave rectifier, peak voltage across full secondary winding is 20 V, then PIV for each diode is
   a) 10 V
   b) $20/\sqrt{2}$
   c) 20
   d) 40

13) The magnitude of collector junction reverse bias voltage increases, then effective base width is
   a) Decreases
   b) Increases
   c) Remains constant
   d) First increases and then remains constant

14) Stability factor for _____ is $(1 + \beta)$.
   a) Voltage divider bias
   b) Collector to base bias
   c) Fixed bias
   d) Self bias

SLR-TJ – 146

Seat No.	

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

Day and Date : Thursday, 14-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

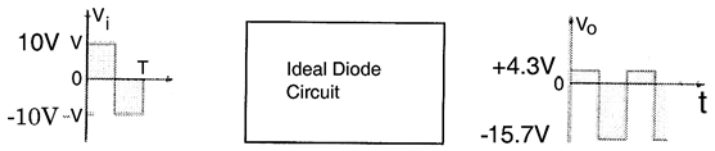
Instructions *: 1)* ***All*** *questions are* ***compulsory***
2) ***Assume*** *suitable data* ***if required****.*
3) Figures to ***right*** *indicate* ***maximum*** *marks.*
4) ***Use*** *of data sheet is* ***allowed****.*

SECTION – I

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

a) What is dynamic resistance of diode ? Derive an expression of dynamic resistance of diode.

b) Design a suitable circuit to perform function indicated.



c) Explain how Zener diode can be used as a voltage regulator.

d) Derive an expression of ripple factor for CLC filter.

e) A full wave rectifier is fed from transformer having centre tapped secondary winding. The rms voltage from either end of secondary to centre tap is 30 V. If diode forward resistance is $2\,\Omega$ and secondary winding resistance is $8\,\Omega$ for load of $1\,K\Omega$. Calculate.

i) Power delivered to load

ii) Rectification efficiency.

3. Attempt **any two** : **(2×6=12)**

   a) What is Clipper ? Explain with suitable circuit diagram, waveforms and transfer characteristics working of biased series positive and biased shunt negative clipper.

   b) With suitable circuit diagram explain operation of voltage doubler and voltage trippler circuit.

   c) Design bridge rectifier circuit with capacitor filter to provide 12V DC and load current of 120 mA and ripple factor of 5%.

SECTION – II

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

   a) Explain effect of emitter bypass capacitor and coupling capacitor on low frequency response.

   b) Explain drain and transfer characteristics of N channel DMOSFET.

   c) 'Q-point at saturation and at cut off results to distortion'. Justify answer with suitable waveforms.

   d) Explain switching characteristics of BJT.

   e) Compare BJT, JFET and MOSFET.

5. Attempt **any two** : **(2×6=12)**

   a) What is stability factor ? Derive expression for stability factor S of voltage divider bias circuit. Explain how it stabilizes the operating point.

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   c) Explain Working of Astable multivibrator and derive an expression for its frequency of oscillation. Sketch associated waveforms.

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SLR-TJ – 147

Seat No.	

Set P

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

Day and Date : Saturday, 16-12-2017 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 ***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 alternative : **(14×1=14)**

1) When 90-A current flows into four parallel resistors having resistances of 5 ohm, 6 ohm, 12 ohm and 20 ohm the current in 5 ohm resistor is
a) 36 A b) 90 A c) 4 A d) none

2) Thevenin's equivalent circuit consists of
a) Voltage source in parallel with resistance
b) Voltage source in series with resistance
c) Current source in series with resistance
d) Current source in parallel with resistance

3) In the parallel RLC circuit the impedance at resonance is
a) Maximum b) Minimum c) Zero d) Infinity

4) In a parallel resonance circuit, why does the current leads the source voltage at frequencies above 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

5) In a certain series resonant circuit, V_C = 150 V, V_L = 150 V and V_R = 50 V. What is the value of the source voltage ?
a) Zero b) 50 V c) 150 V d) 200 V

6) In a two port network the condition for reciprocity in terms of H parameter is
a) h12 = h21 b) h11 = h12 c) h11 = – h22 d) h12 = – h21

P.T.O.

7) What is the driving point impedance at port 1 – 1' with port 2 – 2' open circuited for the network shown in figure 1 ?
   a) 4 ohm b) 3 ohm c) 5 ohm d) 2.2 ohm

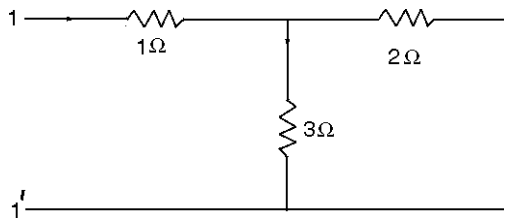

Figure 1

8) The transient response occurs
   a) only in resistive circuits
   b) only in inductive circuits
   c) only in capacitive circuits
   d) both in inductive and capacitive circuits

9) When a series RL circuit is connected to a voltage source V at t = 0, the current passing through the inductor L at $t = 0^+$ is
   a) V/R b) Infinite c) Zero d) V/L

10) The transfer impedance is defined as
   a) the ratio of transform voltage to transform current at the same port
   b) the ratio of transform voltage at one port to transform current at the other port
   c) both a) and b)
   d) none of the above

11) 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 to 10 kHz d) Can't say

12) Parallel connection of LPF with cutoff 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

13) A band pass filter may be obtained by using a low pass filter followed by a high pass filter in which cut-off frequency of the low pass filter is _____ the cut-off frequency of high pass filter.
   a) above b) below c) same d) none of above

14) 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-plane
   c) all the poles lie on imaginary axis of the s-plane
   d) all the poles lie on left half of the s-plane

_____

SLR-TJ – 147

Seat No.	

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

Day and Date : Saturday, 16-12-2017 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) Write the mesh equations for the circuit shown in figure 1 and determine the currents I, I_2 and I_3.

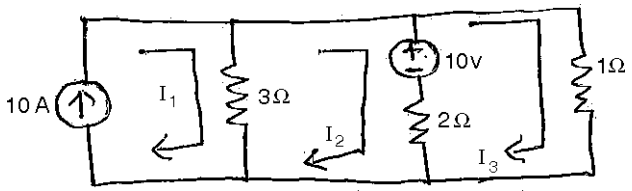

Figure 1

b) Determine the h parameters for the two port network shown in figure 2.

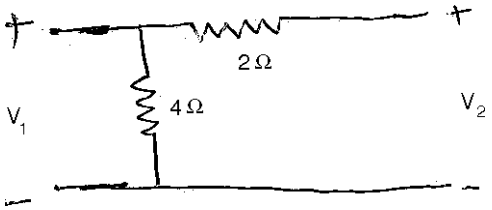

Figure 2

c) Two impedances Z1 = 20 + j10 and Z2 = 10 – j30 are connected in parallel and this combination is connected in series with Z3 = 30 + jX. Find the value of X which will produce resonance.

d) Express ABCD parameters in terms of Z parameters.

e) For the circuit shown in figure 3, at a frequency 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.

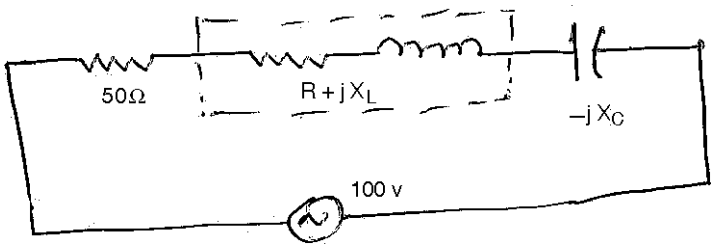

Figure 3

3. Answer **any two** : **(6×2=12)**

a) For the circuit shown in figure 4, what will be the value of R_L to get the maximum power delivered to the load ? What is the maximum voltage across the load ? What is the maximum current in the load ?

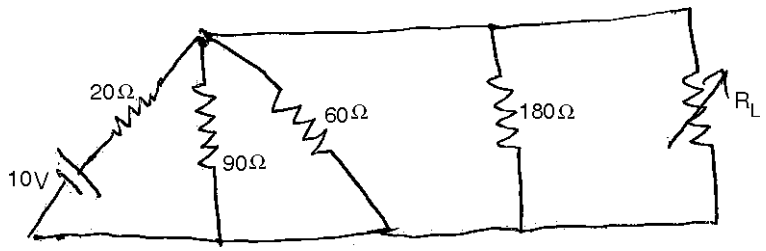

Figure 4

b) Prove the bandwidth of series RLC circuit is the ratio of R and $2\pi L$. Also explain magnification in series RLC circuit.

c) Obtain the Z parameters of the two port network shown in Figure 5.

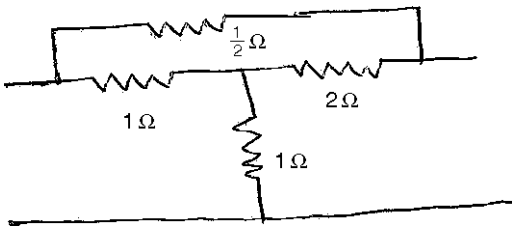

Figure 5

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) Explain DC response of series RL circuit.

b) For the network shown in figure 6, find the transfer function $G_2 1(s)$.

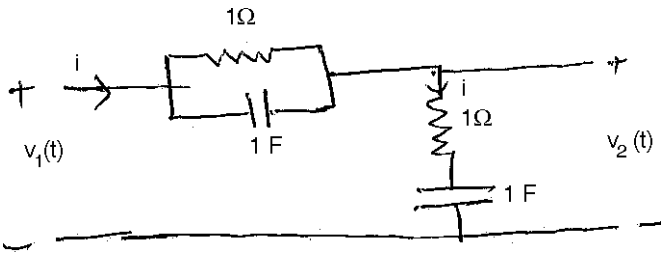

Figure 6

c) A T-section low pass filter has series inductance 80 mH and a shunt capacitance of 0.022 μF. Determine the cut-off frequency and nominal design impedance. Obtain the equivalent π-section.

d) Design a L-type attenuator to operate into a load resistance of 600 Ω with an attenuation of 20 dB.

e) Write necessary condition for a driving point function.

5. Answer **any two** : **(6×2=12)**

a) Explain DC response of series RLC circuit.

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

c) For the given network function draw the pole zero diagram and hence obtain the time domain response i(t).

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

Set P

SLR-TJ – 147

Seat No.	

Set Q

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

Day and Date : Saturday, 16-12-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions : *1) Figures to the **right** indicate **full** marks.*
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*3) Q. No. **1** is **compulsory**. It should be solved in **first 30 minutes** in Answer Book Page No. **3**. **Each** question carries **one** mark.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The transient response occurs
   a) only in resistive circuits
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2) When a series RL circuit is connected to a voltage source V at t = 0, the current passing through the inductor L at $t = 0^+$ is
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3) The transfer impedance is defined as
   a) the ratio of transform voltage to transform current at the same port
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   c) both a) and b)
   d) none of the above

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5) Parallel connection of LPF with cutoff frequency f_1 and HPF with cutoff frequency f_2 gives band stop filter if
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   c) $f_1 = f_2$ d) none of the above

6) A band pass filter may be obtained by using a low pass filter followed by a high pass filter in which cut-off frequency of the low pass filter is _____ the cut-off frequency of high pass filter.
   a) above b) below c) same d) none of above

P.T.O.

7) 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-plane
   c) all the poles lie on imaginary axis of the s-plane
   d) all the poles lie on left half of the s-plane

8) When 90-A current flows into four parallel resistors having resistances of 5 ohm, 6 ohm, 12 ohm and 20 ohm the current in 5 ohm resistor is
   a) 36 A b) 90 A c) 4 A d) none

9) Thevenin's equivalent circuit consists of
   a) Voltage source in parallel with resistance
   b) Voltage source in series with resistance
   c) Current source in series with resistance
   d) Current source in parallel with resistance

10) In the parallel RLC circuit the impedance at resonance is
   a) Maximum b) Minimum c) Zero d) Infinity

11) In a parallel resonance circuit, why does the current leads the source voltage at frequencies above resonance ?
   a) Because the circuit is predominantly resistive
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12) In a certain series resonant circuit, V_C = 150 V, V_L = 150 V and V_R = 50 V. What is the value of the source voltage ?
   a) Zero b) 50 V c) 150 V d) 200 V

13) In a two port network the condition for reciprocity in terms of H parameter is
   a) h12 = h21 b) h11 = h12 c) h11 = – h22 d) h12 = – h21

14) What is the driving point impedance at port 1 – 1' with port 2 – 2' open circuited for the network shown in figure 1 ?
   a) 4 ohm b) 3 ohm c) 5 ohm d) 2.2 ohm

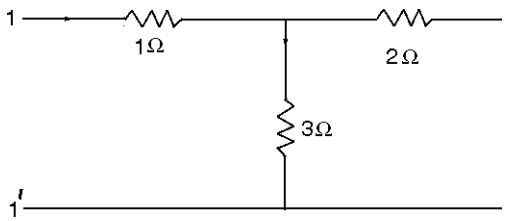

Figure 1

Set Q

SLR-TJ – 147

Seat No.	

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

Day and Date : Saturday, 16-12-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

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

2. Answer **any four** : **(4×4=16)**

a) Write the mesh equations for the circuit shown in figure 1 and determine the currents I, I_2 and I_3.

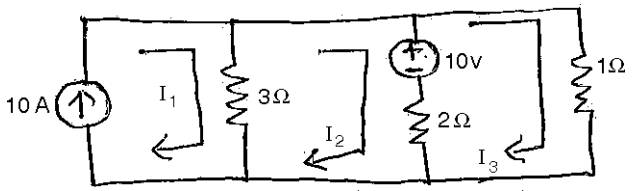

Figure 1

b) Determine the h parameters for the two port network shown in figure 2.

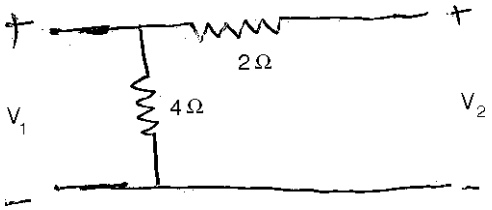

Figure 2

c) Two impedances Z1 = 20 + j10 and Z2 = 10 – j30 are connected in parallel and this combination is connected in series with Z3 = 30 + jX. Find the value of X which will produce resonance.

d) Express ABCD parameters in terms of Z parameters.

e) For the circuit shown in figure 3, at a frequency 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.

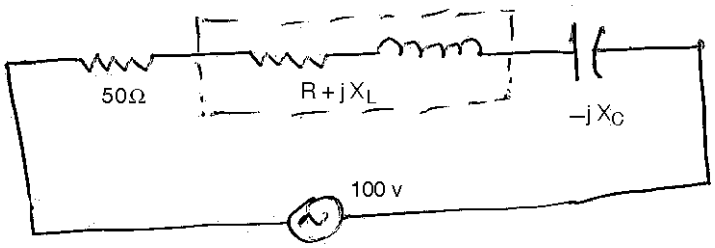

Figure 3

3. Answer **any two** : **(6×2=12)**

a) For the circuit shown in figure 4, what will be the value of R_L to get the maximum power delivered to the load ? What is the maximum voltage across the load ? What is the maximum current in the load ?

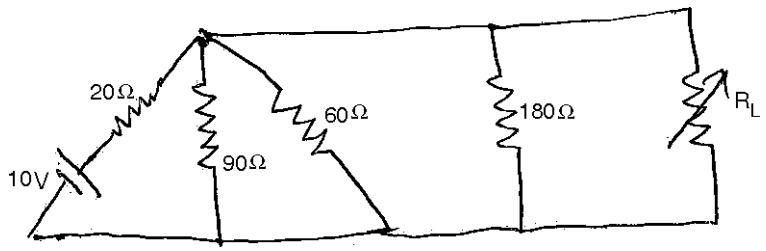

Figure 4

b) Prove the bandwidth of series RLC circuit is the ratio of R and $2\pi L$. Also explain magnification in series RLC circuit.

c) Obtain the Z parameters of the two port network shown in Figure 5.

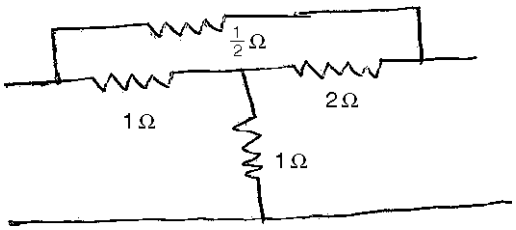

Figure 5

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) Explain DC response of series RL circuit.

b) For the network shown in figure 6, find the transfer function $G_2 1(s)$.

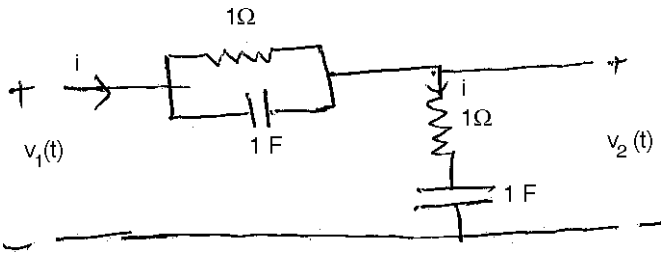

Figure 6

c) A T-section low pass filter has series inductance 80 mH and a shunt capacitance of 0.022 μF. Determine the cut-off frequency and nominal design impedance. Obtain the equivalent π-section.

d) Design a L-type attenuator to operate into a load resistance of 600 Ω with an attenuation of 20 dB.

e) Write necessary condition for a driving point function.

5. Answer **any two** : **(6×2=12)**

a) Explain DC response of series RLC circuit.

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

c) For the given network function draw the pole zero diagram and hence obtain the time domain response i(t).

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

Set Q

SLR-TJ – 147

Seat No.	

Set **R**

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

Day and Date : Saturday, 16-12-2017 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 ***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 alternative : **(14×1=14)**

1) In a certain series resonant circuit, $V_C = 150$ V, $V_L = 150$ V and $V_R = 50$ V. What is the value of the source voltage ?
a) Zero b) 50 V c) 150 V d) 200 V

2) In a two port network the condition for reciprocity in terms of H parameter is
a) h12 = h21 b) h11 = h12 c) h11 = – h22 d) h12 = – h21

3) What is the driving point impedance at port 1 – 1' with port 2 – 2' open circuited for the network shown in figure 1 ?
a) 4 ohm b) 3 ohm c) 5 ohm d) 2.2 ohm

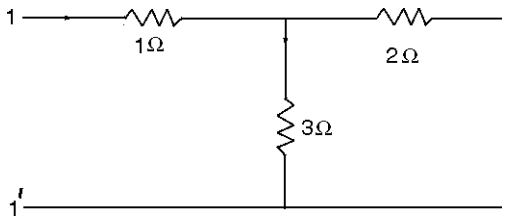

Figure 1

4) The transient response occurs
a) only in resistive circuits
b) only in inductive circuits
c) only in capacitive circuits
d) both in inductive and capacitive circuits

5) When a series RL circuit is connected to a voltage source V at t = 0, the current passing through the inductor L at $t = 0^+$ is
a) V/R b) Infinite c) Zero d) V/L

P.T.O.

6) The transfer impedance is defined as
   a) the ratio of transform voltage to transform current at the same port
   b) the ratio of transform voltage at one port to transform current at the other port
   c) both a) and b)
   d) none of the above

7) 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 to 10 kHz
   d) Can't say

8) Parallel connection of LPF with cutoff 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

9) A band pass filter may be obtained by using a low pass filter followed by a high pass filter in which cut-off frequency of the low pass filter is _____ the cut-off frequency of high pass filter.
   a) above b) below c) same d) none of above

10) 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-plane
   c) all the poles lie on imaginary axis of the s-plane
   d) all the poles lie on left half of the s-plane

11) When 90-A current flows into four parallel resistors having resistances of 5 ohm, 6 ohm, 12 ohm and 20 ohm the current in 5 ohm resistor is
   a) 36 A b) 90 A c) 4 A d) none

12) Thevenin's equivalent circuit consists of
   a) Voltage source in parallel with resistance
   b) Voltage source in series with resistance
   c) Current source in series with resistance
   d) Current source in parallel with resistance

13) In the parallel RLC circuit the impedance at resonance is
   a) Maximum b) Minimum c) Zero d) Infinity

14) In a parallel resonance circuit, why does the current leads the source voltage at frequencies above 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

_____

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Seat No.	

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

Day and Date : Saturday, 16-12-2017 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) Write the mesh equations for the circuit shown in figure 1 and determine the currents I, I_2 and I_3.

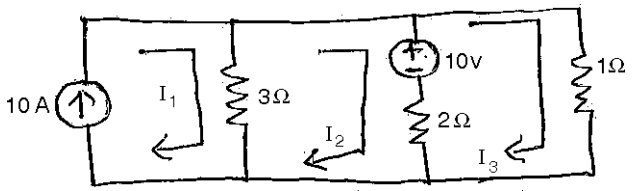

Figure 1

b) Determine the h parameters for the two port network shown in figure 2.

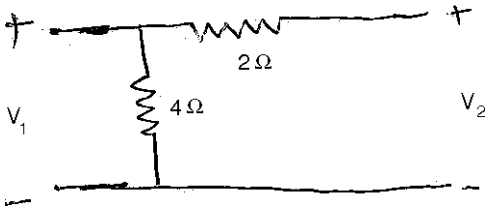

Figure 2

c) Two impedances Z1 = 20 + j10 and Z2 = 10 – j30 are connected in parallel and this combination is connected in series with Z3 = 30 + jX. Find the value of X which will produce resonance.

d) Express ABCD parameters in terms of Z parameters.

e) For the circuit shown in figure 3, at a frequency 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.

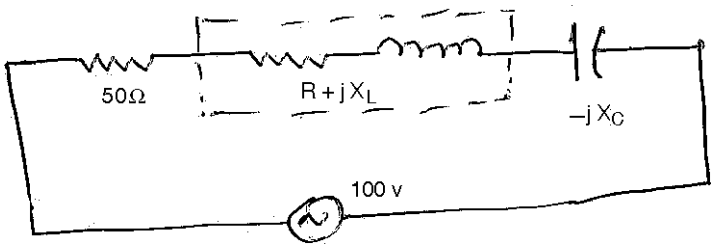

Figure 3

3. Answer **any two** : **(6×2=12)**

a) For the circuit shown in figure 4, what will be the value of R_L to get the maximum power delivered to the load ? What is the maximum voltage across the load ? What is the maximum current in the load ?

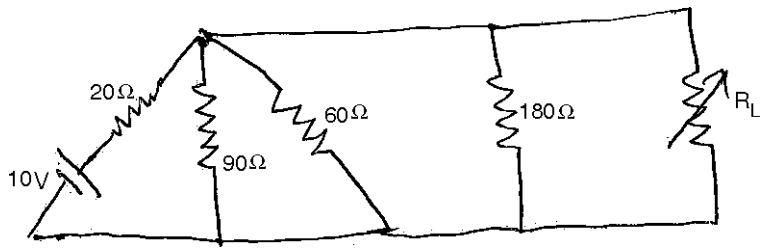

Figure 4

b) Prove the bandwidth of series RLC circuit is the ratio of R and $2\pi L$. Also explain magnification in series RLC circuit.

c) Obtain the Z parameters of the two port network shown in Figure 5.

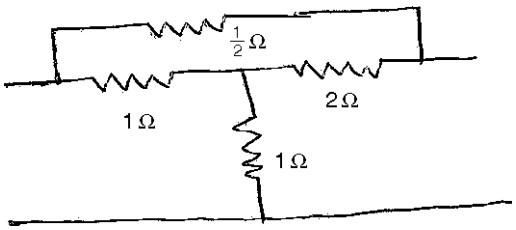

Figure 5

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) Explain DC response of series RL circuit.

b) For the network shown in figure 6, find the transfer function $G_2 1(s)$.

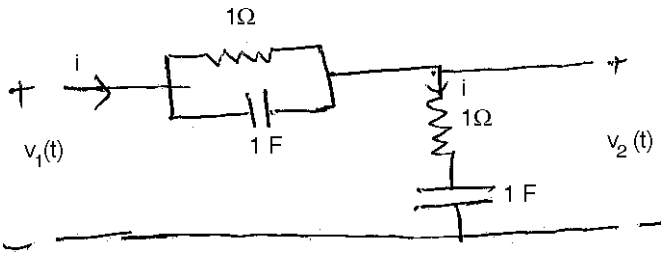

Figure 6

c) A T-section low pass filter has series inductance 80 mH and a shunt capacitance of 0.022 μF. Determine the cut-off frequency and nominal design impedance. Obtain the equivalent π-section.

d) Design a L-type attenuator to operate into a load resistance of 600 Ω with an attenuation of 20 dB.

e) Write necessary condition for a driving point function.

5. Answer **any two** : **(6×2=12)**

a) Explain DC response of series RLC circuit.

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

c) For the given network function draw the pole zero diagram and hence obtain the time domain response i(t).

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

Set R

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Seat No.	

Set **S**

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

Day and Date : Saturday, 16-12-2017 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 ***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 alternative : **(14×1=14)**

1) The transfer impedance is defined as
   a) the ratio of transform voltage to transform current at the same port
   b) the ratio of transform voltage at one port to transform current at the other port
   c) both a) and b)
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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 to 10 kHz d) Can't say

3) Parallel connection of LPF with cutoff 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

4) A band pass filter may be obtained by using a low pass filter followed by a high pass filter in which cut-off frequency of the low pass filter is _____ the cut-off frequency of high pass filter.
   a) above b) below c) same d) none of above

5) The system is said to be stable, if and only if
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   c) all the poles lie on imaginary axis of the s-plane
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6) When 90-A current flows into four parallel resistors having resistances of 5 ohm, 6 ohm, 12 ohm and 20 ohm the current in 5 ohm resistor is
   a) 36 A b) 90 A c) 4 A d) none

7) Thevenin's equivalent circuit consists of
   a) Voltage source in parallel with resistance
   b) Voltage source in series with resistance
   c) Current source in series with resistance
   d) Current source in parallel with resistance

8) In the parallel RLC circuit the impedance at resonance is
   a) Maximum b) Minimum c) Zero d) Infinity

9) In a parallel resonance circuit, why does the current leads the source voltage at frequencies above 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

10) In a certain series resonant circuit, V_C = 150 V, V_L = 150 V and V_R = 50 V. What is the value of the source voltage ?
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11) In a two port network the condition for reciprocity in terms of H parameter is
   a) h12 = h21 b) h11 = h12 c) h11 = – h22 d) h12 = – h21

12) What is the driving point impedance at port 1 – 1' with port 2 – 2' open circuited for the network shown in figure 1 ?
   a) 4 ohm b) 3 ohm c) 5 ohm d) 2.2 ohm

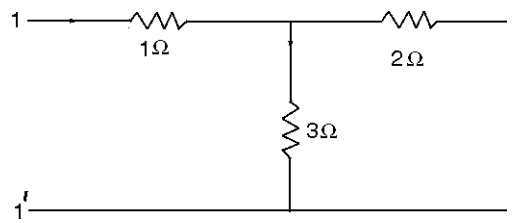

Figure 1

13) The transient response occurs
   a) only in resistive circuits
   b) only in inductive circuits
   c) only in capacitive circuits
   d) both in inductive and capacitive circuits

14) When a series RL circuit is connected to a voltage source V at t = 0, the current passing through the inductor L at $t = 0^+$ is
   a) V/R b) Infinite c) Zero d) V/L

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SLR-TJ – 147

Seat No.	

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

Day and Date : Saturday, 16-12-2017 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) Write the mesh equations for the circuit shown in figure 1 and determine the currents I, I_2 and I_3.

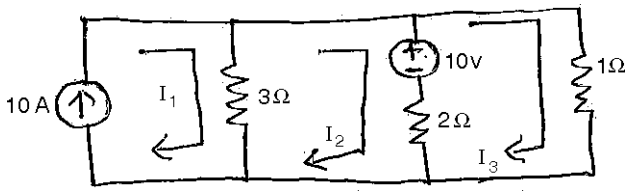

Figure 1

b) Determine the h parameters for the two port network shown in figure 2.

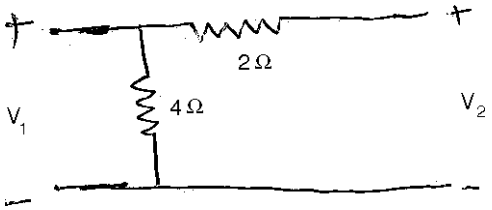

Figure 2

c) Two impedances Z1 = 20 + j10 and Z2 = 10 – j30 are connected in parallel and this combination is connected in series with Z3 = 30 + jX. Find the value of X which will produce resonance.

d) Express ABCD parameters in terms of Z parameters.

e) For the circuit shown in figure 3, at a frequency 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.

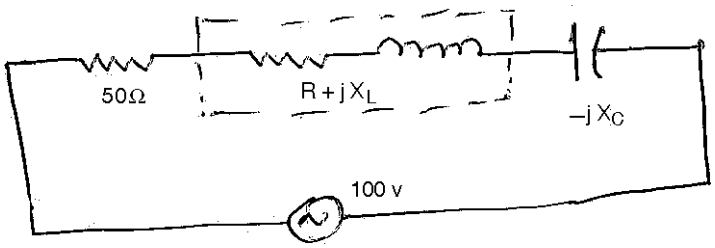

Figure 3

3. Answer **any two** : **(6×2=12)**

a) For the circuit shown in figure 4, what will be the value of R_L to get the maximum power delivered to the load ? What is the maximum voltage across the load ? What is the maximum current in the load ?

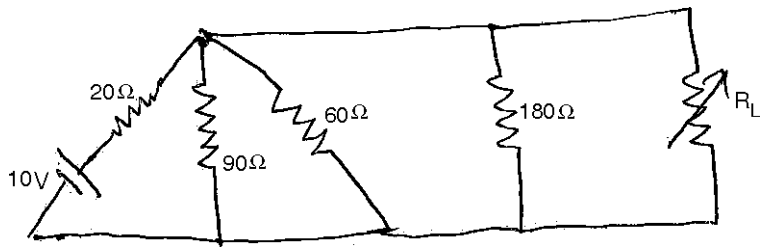

Figure 4

b) Prove the bandwidth of series RLC circuit is the ratio of R and 2π L. Also explain magnification in series RLC circuit.

c) Obtain the Z parameters of the two port network shown in Figure 5.

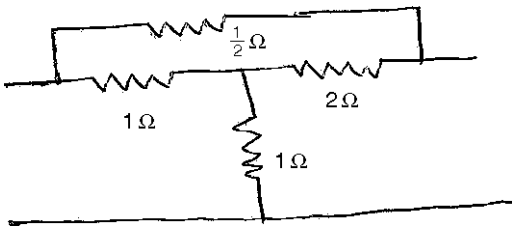

Figure 5

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) Explain DC response of series RL circuit.

b) For the network shown in figure 6, find the transfer function $G_2 1(s)$.

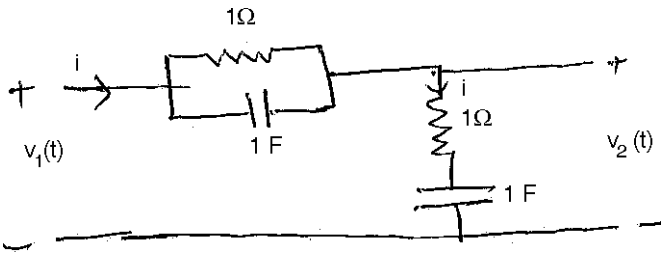

Figure 6

c) A T-section low pass filter has series inductance 80 mH and a shunt capacitance of 0.022 μF. Determine the cut-off frequency and nominal design impedance. Obtain the equivalent π-section.

d) Design a L-type attenuator to operate into a load resistance of 600 Ω with an attenuation of 20 dB.

e) Write necessary condition for a driving point function.

5. Answer **any two** : **(6×2=12)**

a) Explain DC response of series RLC circuit.

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

c) For the given network function draw the pole zero diagram and hence obtain the time domain response i(t).

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

Set S

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Seat No.	

Set P

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

Day and Date : Tuesday, 19-12-2017 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) **All** questions are **compulsory**.*
*4) Figures to the **right** indicates **full** marks.*
*5) Assume suitable data **wherever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : **14**

1. Choose the correct answer :

1) Which of the following code is known as 8421 code ?
a) Gray code b) XS-3 code c) ASCII code d) BCD code

2) The logic expression F = (A + B + C') (A + C') (B + C') (A + C') is in
a) SOP form b) POS form
c) Standard SOP form d) Standard POS form

3) K-map is used to
a) to minimize the number of Flip-flops in digital circuits
b) to minimize the number of gates in digital circuits
c) to minimize the number of gates and the function in requirements of the gates in digital circuits
d) to design gates

4) A device whose inputs are decimal digits and /or alphabetic characters and whose outputs are coded representations of those inputs is called
a) an encoder b) a decoder
c) a code converter d) a decimal converter

5) The fastest logic family is
a) TTL b) ECL c) IIL d) MOS

6) Demultiplexer is represented by
a) $2^n \times 1$ b) $2^n \times n$ c) $n \times 2^n$ d) 1×2^n

7) An example of canonical SOP is
   a) ABC+BC+AB b) AB
   c) ABC + AB d) AB'C + AB'C

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

9) When the following input combinations is not allowed in an SR flip-flop ?
   a) S = 0, R = 0 b) S = 0, R = 1
   c) S = 1, R = 0 d) S = 1, R = 1

10) The number of flip-flop required for decade counter is
   a) 3 b) 4 c) 5 d) 10

11) PLA is
   a) Mask programmable b) Field programmable
   c) Can be programmed by user d) Can be erased and programmed

12) A MOD-13 counter must have
   a) 13 flip-flops b) 3 flip-flops c) 4 flip-flops d) none of these

13) The output of the Moore machine is the function of
   a) next state b) present inputs
   c) present state and present inputs d) present state

14) The output of logic circuit depends upon the sequence in which the input is applied. The circuit is
   a) is a combinational logic circuit
   b) is a sequential logic circuit
   c) may be combinational or sequential logic circuit
   d) none of above

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SLR-TJ – 148

Seat No.	

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

Day and Date : Tuesday, 19-12-2017 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 ***wherever*** *necessary.*

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   a) Write the Hamming (7, 4) code using for data $(0101)_2$ and $(0\ 1\ 1\ 1)_2$.
   b) Derive a code table for BCD code 2421 which satisfies self complementary property.
   c) Design a 1 : 16 de-multiplexer using only 1 : 4 de-multiplexers. Explain the operation with truth table.
   d) Simplify the following Boolean expression, using four-variable map.
      F(w, x, y, z) = wyz + w'x'+ wxz'
   e) Define following logic family parameters fan-in, fan-out, noise margin and propagation delay.

3. Attempt **any two**: **(6×2=12)**
   a) A majority circuit is a combinational circuit whose output is equal to 1 if the input variables have more 1's than 0's. The output is 0 otherwise. Design a 3-input majority circuit by finding the circuit's truth table, Boolean equation and a logic diagram.
   b) Design and implement an odd parity generator and checker for 3 bit information using a 16 : 1 de-multiplexer.
   c) Design a combinational circuit that converts a 4-bit binary code to a 4-bit gray number using Ex-OR gates only.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   a) Show that JK flip-flop can be used as T flip-flop.
   b) Construct a D flip-flop using NAND gates. Derive the characteristic equation.
   c) Compare Mealy and Moore machines with examples.
   d) Implement the Boolean function $F(x, y) = \sum m (0, 1)$ using PLA.
   e) Design and explain 3 bit simple ring counter to rotate "110" data.

5. Attempt **any two** : **(6×2=12)**
   a) Design and implement mod 11 asynchronous counter using JK FF. Draw neat circuit diagram and waveforms.
   b) Draw a JK flip-flop using NAND gates. Derive state diagram and an excitation table for JK flip-flop.
   c) For the following state table

	Next State		Output	
Present State	**x = 0**	**x = 1**	**x = 0**	**x = 1**
a	f	b	0	0
b	d	c	0	0
c	f	e	0	0
d	g	a	1	0
e	d	c	0	0
f	f	b	1	1
g	g	h	0	1
h	g	a	1	0

Draw the corresponding state diagram. Tabulate the reduced state table. Draw the state diagram corresponding to the reduced state table.

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Seat No.	

Set Q

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

Day and Date : Tuesday, 19-12-2017 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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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : **14**

1. Choose the correct answer :

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

2) When the following input combinations is not allowed in an SR flip-flop ?
   a) S = 0, R = 0 b) S = 0, R = 1
   c) S = 1, R = 0 d) S = 1, R = 1

3) The number of flip-flop required for decade counter is
   a) 3 b) 4 c) 5 d) 10

4) PLA is
   a) Mask programmable b) Field programmable
   c) Can be programmed by user d) Can be erased and programmed

5) A MOD-13 counter must have
   a) 13 flip-flops b) 3 flip-flops c) 4 flip-flops d) none of these

6) The output of the Moore machine is the function of
   a) next state b) present inputs
   c) present state and present inputs d) present state

P.T.O.

7) The output of logic circuit depends upon the sequence in which the input is applied. The circuit is
   a) is a combinational logic circuit
   b) is a sequential logic circuit
   c) may be combinational or sequential logic circuit
   d) none of above

8) Which of the following code is known as 8421 code ?
   a) Gray code b) XS-3 code c) ASCII code d) BCD code

9) The logic expression F = (A + B + C') (A + C') (B + C') (A + C') is in
   a) SOP form b) POS form
   c) Standard SOP form d) Standard POS form

10) K-map is used to
   a) to minimize the number of Flip-flops in digital circuits
   b) to minimize the number of gates in digital circuits
   c) to minimize the number of gates and the function in requirements of the gates in digital circuits
   d) to design gates

11) A device whose inputs are decimal digits and /or alphabetic characters and whose outputs are coded representations of those inputs is called
   a) an encoder b) a decoder
   c) a code converter d) a decimal converter

12) The fastest logic family is
   a) TTL b) ECL c) IIL d) MOS

13) Demultiplexer is represented by
   a) $2^n \times 1$ b) $2^n \times n$ c) $n \times 2^n$ d) 1×2^n

14) An example of canonical SOP is
   a) ABC+BC+AB b) AB
   c) ABC + AB d) AB'C + AB'C

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SLR-TJ – 148

Seat No.	

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

Day and Date : Tuesday, 19-12-2017 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 ***wherever*** *necessary.*

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   a) Write the Hamming (7, 4) code using for data $(0101)_2$ and $(0\ 1\ 1\ 1)_2$.
   b) Derive a code table for BCD code 2421 which satisfies self complementary property.
   c) Design a 1 : 16 de-multiplexer using only 1 : 4 de-multiplexers. Explain the operation with truth table.
   d) Simplify the following Boolean expression, using four-variable map.
      F(w, x, y, z) = wyz + w'x'+ wxz'
   e) Define following logic family parameters fan-in, fan-out, noise margin and propagation delay.

3. Attempt **any two**: **(6×2=12)**
   a) A majority circuit is a combinational circuit whose output is equal to 1 if the input variables have more 1's than 0's. The output is 0 otherwise. Design a 3-input majority circuit by finding the circuit's truth table, Boolean equation and a logic diagram.
   b) Design and implement an odd parity generator and checker for 3 bit information using a 16 : 1 de-multiplexer.
   c) Design a combinational circuit that converts a 4-bit binary code to a 4-bit gray number using Ex-OR gates only.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   a) Show that JK flip-flop can be used as T flip-flop.
   b) Construct a D flip-flop using NAND gates. Derive the characteristic equation.
   c) Compare Mealy and Moore machines with examples.
   d) Implement the Boolean function $F(x, y) = \sum m (0, 1)$ using PLA.
   e) Design and explain 3 bit simple ring counter to rotate "110" data.

5. Attempt **any two** : **(6×2=12)**
   a) Design and implement mod 11 asynchronous counter using JK FF. Draw neat circuit diagram and waveforms.
   b) Draw a JK flip-flop using NAND gates. Derive state diagram and an excitation table for JK flip-flop.
   c) For the following state table

	Next State		Output	
Present State	**x = 0**	**x = 1**	**x = 0**	**x = 1**
a	f	b	0	0
b	d	c	0	0
c	f	e	0	0
d	g	a	1	0
e	d	c	0	0
f	f	b	1	1
g	g	h	0	1
h	g	a	1	0

Draw the corresponding state diagram. Tabulate the reduced state table. Draw the state diagram corresponding to the reduced state table.

SLR-TJ – 148

Seat No.	

Set R

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

Day and Date : Tuesday, 19-12-2017 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) **All** questions are **compulsory**.*
*4) Figures to the **right** indicates **full** marks.*
*5) Assume suitable data **wherever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : **14**

1. Choose the correct answer :

1) The fastest logic family is
   a) TTL b) ECL c) IIL d) MOS

2) Demultiplexer is represented by
   a) $2^n \times 1$ b) $2^n \times n$ c) $n \times 2^n$ d) 1×2^n

3) An example of canonical SOP is
   a) ABC+BC+AB b) AB
   c) ABC + AB d) AB'C + AB'C

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

5) When the following input combinations is not allowed in an SR flip-flop ?
   a) S = 0, R = 0 b) S = 0, R = 1
   c) S = 1, R = 0 d) S = 1, R = 1

6) The number of flip-flop required for decade counter is
   a) 3 b) 4 c) 5 d) 10

7) PLA is
   a) Mask programmable b) Field programmable
   c) Can be programmed by user d) Can be erased and programmed

8) A MOD-13 counter must have
   a) 13 flip-flops b) 3 flip-flops c) 4 flip-flops d) none of these

P.T.O.

9) The output of the Moore machine is the function of
   a) next state
   b) present inputs
   c) present state and present inputs
   d) present state

10) The output of logic circuit depends upon the sequence in which the input is applied. The circuit is
   a) is a combinational logic circuit
   b) is a sequential logic circuit
   c) may be combinational or sequential logic circuit
   d) none of above

11) Which of the following code is known as 8421 code ?
   a) Gray code
   b) XS-3 code
   c) ASCII code
   d) BCD code

12) The logic expression F = (A + B + C') (A + C') (B + C') (A + C') is in
   a) SOP form
   b) POS form
   c) Standard SOP form
   d) Standard POS form

13) K-map is used to
   a) to minimize the number of Flip-flops in digital circuits
   b) to minimize the number of gates in digital circuits
   c) to minimize the number of gates and the function in requirements of the gates in digital circuits
   d) to design gates

14) A device whose inputs are decimal digits and /or alphabetic characters and whose outputs are coded representations of those inputs is called
   a) an encoder
   b) a decoder
   c) a code converter
   d) a decimal converter

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SLR-TJ – 148

Seat No.	

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

Day and Date : Tuesday, 19-12-2017 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 ***wherever*** *necessary.*

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   a) Write the Hamming (7, 4) code using for data $(0101)_2$ and $(0\ 1\ 1\ 1)_2$.
   b) Derive a code table for BCD code 2421 which satisfies self complementary property.
   c) Design a 1 : 16 de-multiplexer using only 1 : 4 de-multiplexers. Explain the operation with truth table.
   d) Simplify the following Boolean expression, using four-variable map.
      F(w, x, y, z) = wyz + w'x'+ wxz'
   e) Define following logic family parameters fan-in, fan-out, noise margin and propagation delay.

3. Attempt **any two**: **(6×2=12)**
   a) A majority circuit is a combinational circuit whose output is equal to 1 if the input variables have more 1's than 0's. The output is 0 otherwise. Design a 3-input majority circuit by finding the circuit's truth table, Boolean equation and a logic diagram.
   b) Design and implement an odd parity generator and checker for 3 bit information using a 16 : 1 de-multiplexer.
   c) Design a combinational circuit that converts a 4-bit binary code to a 4-bit gray number using Ex-OR gates only.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   a) Show that JK flip-flop can be used as T flip-flop.
   b) Construct a D flip-flop using NAND gates. Derive the characteristic equation.
   c) Compare Mealy and Moore machines with examples.
   d) Implement the Boolean function $F(x, y) = \sum m\ (0, 1)$ using PLA.
   e) Design and explain 3 bit simple ring counter to rotate "110" data.

5. Attempt **any two** : **(6×2=12)**
   a) Design and implement mod 11 asynchronous counter using JK FF. Draw neat circuit diagram and waveforms.
   b) Draw a JK flip-flop using NAND gates. Derive state diagram and an excitation table for JK flip-flop.
   c) For the following state table

	Next State		**Output**	
Present State	**x = 0**	**x = 1**	**x = 0**	**x = 1**
a	f	b	0	0
b	d	c	0	0
c	f	e	0	0
d	g	a	1	0
e	d	c	0	0
f	f	b	1	1
g	g	h	0	1
h	g	a	1	0

Draw the corresponding state diagram. Tabulate the reduced state table. Draw the state diagram corresponding to the reduced state table.

_____

SLR-TJ – 148

Seat No.	

Set S

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

Day and Date : Tuesday, 19-12-2017 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) **All** questions are **compulsory**.*
*4) Figures to the **right** indicates **full** marks.*
*5) Assume suitable data **wherever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : **14**

1. Choose the correct answer :

1) The number of flip-flop required for decade counter is
a) 3 b) 4 c) 5 d) 10

2) PLA is
a) Mask programmable b) Field programmable
c) Can be programmed by user d) Can be erased and programmed

3) A MOD-13 counter must have
a) 13 flip-flops b) 3 flip-flops c) 4 flip-flops d) none of these

4) The output of the Moore machine is the function of
a) next state b) present inputs
c) present state and present inputs d) present state

5) The output of logic circuit depends upon the sequence in which the input is applied. The circuit is
a) is a combinational logic circuit
b) is a sequential logic circuit
c) may be combinational or sequential logic circuit
d) none of above

6) Which of the following code is known as 8421 code ?
a) Gray code b) XS-3 code c) ASCII code d) BCD code

7) The logic expression F = (A + B + C') (A + C') (B + C') (A + C') is in
   a) SOP form b) POS form
   c) Standard SOP form d) Standard POS form

8) K-map is used to
   a) to minimize the number of Flip-flops in digital circuits
   b) to minimize the number of gates in digital circuits
   c) to minimize the number of gates and the function in requirements of the gates in digital circuits
   d) to design gates

9) A device whose inputs are decimal digits and /or alphabetic characters and whose outputs are coded representations of those inputs is called
   a) an encoder b) a decoder
   c) a code converter d) a decimal converter

10) The fastest logic family is
   a) TTL b) ECL c) IIL d) MOS

11) Demultiplexer is represented by
   a) $2^n \times 1$ b) $2^n \times n$ c) $n \times 2^n$ d) 1×2^n

12) An example of canonical SOP is
   a) ABC+BC+AB b) AB
   c) ABC + AB d) AB'C + AB'C

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

14) When the following input combinations is not allowed in an SR flip-flop ?
   a) S = 0, R = 0 b) S = 0, R = 1
   c) S = 1, R = 0 d) S = 1, R = 1

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SLR-TJ – 148

Seat No.	

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

Day and Date : Tuesday, 19-12-2017 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 ***wherever*** *necessary.*

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   a) Write the Hamming (7, 4) code using for data $(0101)_2$ and $(0\ 1\ 1\ 1)_2$.
   b) Derive a code table for BCD code 2421 which satisfies self complementary property.
   c) Design a 1 : 16 de-multiplexer using only 1 : 4 de-multiplexers. Explain the operation with truth table.
   d) Simplify the following Boolean expression, using four-variable map.
      F(w, x, y, z) = wyz + w'x'+ wxz'
   e) Define following logic family parameters fan-in, fan-out, noise margin and propagation delay.

3. Attempt **any two**: **(6×2=12)**
   a) A majority circuit is a combinational circuit whose output is equal to 1 if the input variables have more 1's than 0's. The output is 0 otherwise. Design a 3-input majority circuit by finding the circuit's truth table, Boolean equation and a logic diagram.
   b) Design and implement an odd parity generator and checker for 3 bit information using a 16 : 1 de-multiplexer.
   c) Design a combinational circuit that converts a 4-bit binary code to a 4-bit gray number using Ex-OR gates only.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   a) Show that JK flip-flop can be used as T flip-flop.
   b) Construct a D flip-flop using NAND gates. Derive the characteristic equation.
   c) Compare Mealy and Moore machines with examples.
   d) Implement the Boolean function $F(x, y) = \sum m (0, 1)$ using PLA.
   e) Design and explain 3 bit simple ring counter to rotate "110" data.

5. Attempt **any two** : **(6×2=12)**
   a) Design and implement mod 11 asynchronous counter using JK FF. Draw neat circuit diagram and waveforms.
   b) Draw a JK flip-flop using NAND gates. Derive state diagram and an excitation table for JK flip-flop.
   c) For the following state table

	Next State		Output	
Present State	**x = 0**	**x = 1**	**x = 0**	**x = 1**
a	f	b	0	0
b	d	c	0	0
c	f	e	0	0
d	g	a	1	0
e	d	c	0	0
f	f	b	1	1
g	g	h	0	1
h	g	a	1	0

Draw the corresponding state diagram. Tabulate the reduced state table. Draw the state diagram corresponding to the reduced state table.

SLR-TJ – 149

Seat No.	

Set **P**

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

Day and Date : Thursday, 21-12-2017 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) Figures to the **right** indicates **full** marks.*
*5) **Assume** suitable data, if necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) In linked list implementation of a queue, where does a new element is inserted ?
   a) At the head of link list
   b) At the tail of the link list
   c) At the centre position in the link list
   d) None

2) A circular queue is implemented using an array of size 10. The array index starts with 0, front is 6, and rear is 9. The insertion of next element takes place at the array index
   a) 0 b) 7
   c) 9 d) 10

3) The retrieval of items in a stack is _____ operation.
   a) Push b) Pop
   c) Retrieval d) Access

4) A variant of linked list in which last node of the list points to the first node of the list is
   a) Singly linked list b) Doubly linked list
   c) Circular linked list d) Multiply linked list

5) Consider the below representation
```
struct node
{
    int data;
    struct node *next;
} * start=NULL;
```
Predict what will be printed on the screen by following statement ?
start $\rightarrow$ next $\rightarrow$ data
a) Access the "data" field of 3rd node
b) None of these
c) Access the "data" field of 1st node
d) Access the "data" field of 2nd node

6) What will happen if base condition is not defined in recursion ?
a) Stack underflow b) Stack overflow
c) None of these d) Both a) and b)

7) Which of the following is not an inherent application of stack ?
a) Reversing a string
b) Evaluation of postfix expression
c) Implementation of recursion
d) Job scheduling

8) For a linear search in an array of n elements the time complexity for best, worst and average case are _____, _____ and _____ respectively.
a) O(n), O(1) and O(n/2) b) O(1), O(n) and O(n/2)
c) O(1), O(n) and O(n) d) O(1), O(n) and O(n-1/2)

9) A terminal node in a binary tree is called _____
a) Root b) Leaf c) Child d) Branch

10) How many swaps are required to sort the given array using bubble sort - {2, 5, 1, 3, 4} ?
a) 4 b) 5 c) 6 d) 7

11) The number of binary trees with 3 nodes which when traversed in post order gives the sequence A, B, C is
a) 3 b) 9 c) 7 d) 5

12) In a graph if E = (u, v) means _____
a) u is adjacent to v but v is not adjacent to u
b) E begins at u and ends at v
c) u is predecessor and v is successor
d) Both b) and c)

13) If a node having two children is deleted from a binary tree, it is replaced by its
a) inorder predecessor b) inorder successor
c) preorder predecessor d) none of these

14) The searching technique that takes O(1) time of find a data is _____
a) Linear Search b) Binary Search c) Hashing d) Tree Search

_____

SLR-TJ – 149

Seat No.	

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

Day and Date : Thursday, 21-12-2017 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) What is avail list ? Explain with algorithm for getnode and freenode using diagram.

   2) What is recursion ? Explain with example how recursion works. Write the general algorithm for recursion.

   3) Evaluate the following postfix expression :

      6, 2, 3, +, -, 3, 8, 2, /, +, *, 2, -, 3, +.

   4) What is queue ? Explain the different operations that are performed on a simple queue.

   5) What is linear and non-linear data structure ? Explain the difference between a stack and a queue data structure.

3. Attempt **any two** : **(2×6=12)**

   1) Write a C program for the implementation of stack using array of size 5.

   2) Write a C program for printing a list in reverse order using recursion.

   3) Write a C program for the implementation of circular linked list for Josephus problem.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Write a short note on threaded binary trees.
   2) Write a C program to sort an array of 5 elements using selection sort.
   3) Explain binary search method with algorithm to search an element from an array.
   4) Explain the adjacency linked representation method for a graph.
   5) Define the following terms with suitable diagram :
      a) Leaf nodes
      b) Complete binary tree
      c) Depth of the tree
      d) Siblings.

5. Attempt **any two** : **(2×6=12)**
   1) What are has functions ? Explain the most commonly used hash functions.
   2) What are the graph traversal methods ? Explain any one traversal method with flow chart.
   3) What is merge sort ? Sort the following two arrays using merge sort :

      A = [11, 15, 20, 35, 40]

      B = [9, 17, 22, 50, 52]

SLR-TJ – 149

Seat No.	

Set **Q**

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

Day and Date : Thursday, 21-12-2017 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) Figures to the **right** indicates **full** marks.*
*5) **Assume** suitable data, if necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) For a linear search in an array of n elements the time complexity for best, worst and average case are _____, _____ and _____ respectively.
   a) O(n), O(1) and O(n/2) b) O(1), O(n) and O(n/2)
   c) O(1), O(n) and O(n) d) O(1), O(n) and O(n-1/2)

2) A terminal node in a binary tree is called _____
   a) Root b) Leaf c) Child d) Branch

3) How many swaps are required to sort the given array using bubble sort - {2, 5, 1, 3, 4} ?
   a) 4 b) 5 c) 6 d) 7

4) The number of binary trees with 3 nodes which when traversed in post order gives the sequence A, B, C is
   a) 3 b) 9 c) 7 d) 5

5) In a graph if E = (u, v) means _____
   a) u is adjacent to v but v is not adjacent to u
   b) E begins at u and ends at v
   c) u is predecessor and v is successor
   d) Both b) and c)

6) If a node having two children is deleted from a binary tree, it is replaced by its
   a) inorder predecessor b) inorder successor
   c) preorder predecessor d) none of these

P.T.O.

7) The searching technique that takes O(1) time of find a data is _____
   a) Linear Search b) Binary Search c) Hashing d) Tree Search
8) In linked list implementation of a queue, where does a new element is inserted ?
   a) At the head of link list
   b) At the tail of the link list
   c) At the centre position in the link list
   d) None
9) A circular queue is implemented using an array of size 10. The array index starts with 0, front is 6, and rear is 9. The insertion of next element takes place at the array index
   a) 0 b) 7
   c) 9 d) 10
10) The retrieval of items in a stack is _____ operation.
   a) Push b) Pop
   c) Retrieval d) Access
11) A variant of linked list in which last node of the list points to the first node of the list is
   a) Singly linked list b) Doubly linked list
   c) Circular linked list d) Multiply linked list
12) Consider the below representation

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

Predict what will be printed on the screen by following statement ?
start $\rightarrow$ next $\rightarrow$ data
   a) Access the "data" field of 3rd node
   b) None of these
   c) Access the "data" field of 1st node
   d) Access the "data" field of 2nd node
13) What will happen if base condition is not defined in recursion ?
   a) Stack underflow b) Stack overflow
   c) None of these d) Both a) and b)
14) Which of the following is not an inherent application of stack ?
   a) Reversing a string
   b) Evaluation of postfix expression
   c) Implementation of recursion
   d) Job scheduling

_____

SLR-TJ – 149

Seat No.	

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

Day and Date : Thursday, 21-12-2017 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) What is avail list ? Explain with algorithm for getnode and freenode using diagram.

2) What is recursion ? Explain with example how recursion works. Write the general algorithm for recursion.

3) Evaluate the following postfix expression :

6, 2, 3, +, -, 3, 8, 2, /, +, *, 2, -, 3, +.

4) What is queue ? Explain the different operations that are performed on a simple queue.

5) What is linear and non-linear data structure ? Explain the difference between a stack and a queue data structure.

3. Attempt **any two** : **(2×6=12)**

1) Write a C program for the implementation of stack using array of size 5.

2) Write a C program for printing a list in reverse order using recursion.

3) Write a C program for the implementation of circular linked list for Josephus problem.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Write a short note on threaded binary trees.
   2) Write a C program to sort an array of 5 elements using selection sort.
   3) Explain binary search method with algorithm to search an element from an array.
   4) Explain the adjacency linked representation method for a graph.
   5) Define the following terms with suitable diagram :
      a) Leaf nodes
      b) Complete binary tree
      c) Depth of the tree
      d) Siblings.

5. Attempt **any two** : **(2×6=12)**
   1) What are has functions ? Explain the most commonly used hash functions.
   2) What are the graph traversal methods ? Explain any one traversal method with flow chart.
   3) What is merge sort ? Sort the following two arrays using merge sort :

      A = [11, 15, 20, 35, 40]

      B = [9, 17, 22, 50, 52]

SLR-TJ – 149

Seat No.	

Set **R**

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

Day and Date : Thursday, 21-12-2017 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) Figures to the **right** indicates **full** marks.*
*5) **Assume** suitable data, if necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Consider the below representation

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

Predict what will be printed on the screen by following statement ?
start $\rightarrow$ next $\rightarrow$ data
a) Access the "data" field of 3rd node
b) None of these
c) Access the "data" field of 1st node
d) Access the "data" field of 2nd node

2) What will happen if base condition is not defined in recursion ?
a) Stack underflow b) Stack overflow
c) None of these d) Both a) and b)

3) Which of the following is not an inherent application of stack ?
a) Reversing a string
b) Evaluation of postfix expression
c) Implementation of recursion
d) Job scheduling

4) For a linear search in an array of n elements the time complexity for best, worst and average case are _____, _____ and _____ respectively.
   a) O(n), O(1) and O(n/2) b) O(1), O(n) and O(n/2)
   c) O(1), O(n) and O(n) d) O(1), O(n) and O(n-1/2)
5) A terminal node in a binary tree is called _____
   a) Root b) Leaf c) Child d) Branch
6) How many swaps are required to sort the given array using bubble sort - {2, 5, 1, 3, 4} ?
   a) 4 b) 5 c) 6 d) 7
7) The number of binary trees with 3 nodes which when traversed in post order gives the sequence A, B, C is
   a) 3 b) 9 c) 7 d) 5
8) In a graph if E = (u, v) means _____
   a) u is adjacent to v but v is not adjacent to u
   b) E begins at u and ends at v
   c) u is predecessor and v is successor
   d) Both b) and c)
9) If a node having two children is deleted from a binary tree, it is replaced by its
   a) inorder predecessor b) inorder successor
   c) preorder predecessor d) none of these
10) The searching technique that takes O(1) time of find a data is _____
   a) Linear Search b) Binary Search c) Hashing d) Tree Search
11) In linked list implementation of a queue, where does a new element is inserted ?
   a) At the head of link list
   b) At the tail of the link list
   c) At the centre position in the link list
   d) None
12) A circular queue is implemented using an array of size 10. The array index starts with 0, front is 6, and rear is 9. The insertion of next element takes place at the array index
   a) 0 b) 7
   c) 9 d) 10
13) The retrieval of items in a stack is _____ operation.
   a) Push b) Pop
   c) Retrieval d) Access
14) A variant of linked list in which last node of the list points to the first node of the list is
   a) Singly linked list b) Doubly linked list
   c) Circular linked list d) Multiply linked list

_____

SLR-TJ – 149

Seat No.	

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

Day and Date : Thursday, 21-12-2017 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) What is avail list ? Explain with algorithm for getnode and freenode using diagram.

   2) What is recursion ? Explain with example how recursion works. Write the general algorithm for recursion.

   3) Evaluate the following postfix expression :

      6, 2, 3, +, -, 3, 8, 2, /, +, *, 2, -, 3, +.

   4) What is queue ? Explain the different operations that are performed on a simple queue.

   5) What is linear and non-linear data structure ? Explain the difference between a stack and a queue data structure.

3. Attempt **any two** : **(2×6=12)**

   1) Write a C program for the implementation of stack using array of size 5.

   2) Write a C program for printing a list in reverse order using recursion.

   3) Write a C program for the implementation of circular linked list for Josephus problem.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Write a short note on threaded binary trees.
   2) Write a C program to sort an array of 5 elements using selection sort.
   3) Explain binary search method with algorithm to search an element from an array.
   4) Explain the adjacency linked representation method for a graph.
   5) Define the following terms with suitable diagram :
      a) Leaf nodes
      b) Complete binary tree
      c) Depth of the tree
      d) Siblings.

5. Attempt **any two** : **(2×6=12)**
   1) What are has functions ? Explain the most commonly used hash functions.
   2) What are the graph traversal methods ? Explain any one traversal method with flow chart.
   3) What is merge sort ? Sort the following two arrays using merge sort :

      A = [11, 15, 20, 35, 40]

      B = [9, 17, 22, 50, 52]

SLR-TJ – 149

Seat No.	

Set **S**

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

Day and Date : Thursday, 21-12-2017 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) Figures to the **right** indicates **full** marks.*
*5) **Assume** suitable data, if necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) How many swaps are required to sort the given array using bubble sort - {2, 5, 1, 3, 4} ?
a) 4 b) 5 c) 6 d) 7

2) The number of binary trees with 3 nodes which when traversed in post order gives the sequence A, B, C is
a) 3 b) 9 c) 7 d) 5

3) In a graph if E = (u, v) means _____
a) u is adjacent to v but v is not adjacent to u
b) E begins at u and ends at v
c) u is predecessor and v is successor
d) Both b) and c)

4) If a node having two children is deleted from a binary tree, it is replaced by its
a) inorder predecessor b) inorder successor
c) preorder predecessor d) none of these

5) The searching technique that takes O(1) time of find a data is _____
a) Linear Search b) Binary Search c) Hashing d) Tree Search

6) In linked list implementation of a queue, where does a new element is inserted ?
a) At the head of link list
b) At the tail of the link list
c) At the centre position in the link list
d) None

P.T.O.

7) A circular queue is implemented using an array of size 10. The array index starts with 0, front is 6, and rear is 9. The insertion of next element takes place at the array index
   a) 0 b) 7
   c) 9 d) 10
8) The retrieval of items in a stack is _____ operation.
   a) Push b) Pop
   c) Retrieval d) Access
9) A variant of linked list in which last node of the list points to the first node of the list is
   a) Singly linked list b) Doubly linked list
   c) Circular linked list d) Multiply linked list
10) Consider the below representation

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

Predict what will be printed on the screen by following statement ?
start $\rightarrow$ next $\rightarrow$ data
   a) Access the "data" field of 3rd node
   b) None of these
   c) Access the "data" field of 1st node
   d) Access the "data" field of 2nd node
11) What will happen if base condition is not defined in recursion ?
   a) Stack underflow b) Stack overflow
   c) None of these d) Both a) and b)
12) Which of the following is not an inherent application of stack ?
   a) Reversing a string
   b) Evaluation of postfix expression
   c) Implementation of recursion
   d) Job scheduling
13) For a linear search in an array of n elements the time complexity for best, worst and average case are _____, _____ and _____ respectively.
   a) O(n), O(1) and O(n/2) b) O(1), O(n) and O(n/2)
   c) O(1), O(n) and O(n) d) O(1), O(n) and O(n-1/2)
14) A terminal node in a binary tree is called _____
   a) Root b) Leaf c) Child d) Branch

_____

SLR-TJ – 149

Seat No.	

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

Day and Date : Thursday, 21-12-2017 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) What is avail list ? Explain with algorithm for getnode and freenode using diagram.

2) What is recursion ? Explain with example how recursion works. Write the general algorithm for recursion.

3) Evaluate the following postfix expression :

6, 2, 3, +, -, 3, 8, 2, /, +, *, 2, -, 3, +.

4) What is queue ? Explain the different operations that are performed on a simple queue.

5) What is linear and non-linear data structure ? Explain the difference between a stack and a queue data structure.

3. Attempt **any two** : **(2×6=12)**

1) Write a C program for the implementation of stack using array of size 5.

2) Write a C program for printing a list in reverse order using recursion.

3) Write a C program for the implementation of circular linked list for Josephus problem.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) Write a short note on threaded binary trees.
   2) Write a C program to sort an array of 5 elements using selection sort.
   3) Explain binary search method with algorithm to search an element from an array.
   4) Explain the adjacency linked representation method for a graph.
   5) Define the following terms with suitable diagram :
      a) Leaf nodes
      b) Complete binary tree
      c) Depth of the tree
      d) Siblings.

5. Attempt **any two** : **(2×6=12)**
   1) What are has functions ? Explain the most commonly used hash functions.
   2) What are the graph traversal methods ? Explain any one traversal method with flow chart.
   3) What is merge sort ? Sort the following two arrays using merge sort :

      A = [11, 15, 20, 35, 40]

      B = [9, 17, 22, 50, 52]

SLR-TJ – 150

Seat No.	

Set **P**

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

Day and Date : Tuesday, 21-11-2017 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 ***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 correct option : **(14×1=14)**

1) The power factor of a squirrel cage I.M. at no load is approximately =
   a) 0.2 b) 0.5
   c) 0.9 d) 1

2) Running torque of 3 phase induction motor becomes maximum when
   a) R2 = SX2 b) $I_{ST} = I_{FL}$
   c) R2/X2 = 1 d) R2 × X2 = 1

3) For the application traction following motor is not suitable
   a) dc series motor b) dc shunt motor
   c) both motors d) none of the above

4) In a 3 phase induction motor air gap flux is
   a) pulsating b) constant
   c) rotating d) synchronously rotating

5) The synchronous speed of I.M. is
   a) speed of stator flux b) speed of rotor flux
   c) speed of rotor d) speed of motor

6) The dc _____ motor should never be switched ON no load.
   a) series b) shunt
   c) differential compound d) cumulative compound

7) When power factor of three phase load is 0.8 lagging then wattmeter readings are
   a) $W_1 = W_2$ b) $W_1 < W_2$
   c) $W_1 > W_2$ d) $W_1 \neq W_2$

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) In case of three phase power measurement if W_1 and W_2 are wattmeter readings then $\sqrt{3}[W_1 - W_2] =$
   a) total active power
   b) total reactive power
   c) total apparent power
   d) none of the above

10) 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

11) Following is not three phase transformer connection
   a) V – V
   b) T – T
   c) Y – Y
   d) I – I

12) Which of the following connection is best suitable for 3-phase, 4-wire connection ?
   a) delta - delta
   b) star - star
   c) star - delta
   d) none of the above

13) The main cause of poor power factor is
   a) light loaded induction motor
   b) induction furnace
   c) arc lamp
   d) all of the above

14) In case Scott connection for both primary and secondary winding of main transformer consists of _____% tapping.
   a) 50
   b) 66.66
   c) 83
   d) 58

_____

SLR-TJ – 150

Seat No.	

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

Day and Date : Tuesday, 21-11-2017 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. Solve **any four** : **(4×4=16)**
   a) Write short note on electrical energy generation by using wind turbine.
   b) Draw circuit diagram and explain Swinburne's test. What are its limitations ?
   c) Phase voltage and current of star connected inductive load is 150 V and 25 A power factor load is 0.707 (lagging). Assuming three wire system and power is measured by two wattmeters. Find wattmeter readings.
   d) Six pole lap wound shunt motor has 500 conductor in the armature. The resistance of armature path is 0.05 ohm, resistance of shunt field is 25 ohm. Find the speed of the motor when it takes 120 A from dc mains of 100 V, flux per pole is 20 mwb.
   e) Explain electrical braking used for dc shunt motor.

(6×2=12)

3. a) A 4-pole 230 (v), dc series runs at 1000 (rpm) when the load current is 12(A). The motor resistance is 1.8 (ohm). The series field coils now are regrouped from all 4 in series to 2 in series with two parallel paths the line current is 20 A. If the corresponding field weakening is 15% calculate speed of the motor.

   OR

   b) Draw neat diagram of 3-point starter and explain its working for field failure condition.
   c) Derive an expression for power factor of three phase inductive load in terms of wattmeters reading. Draw phaser diagram.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) A 4 pole, 50 (Hz) three phase induction motor running with speed 1440 (rpm). Find synchronous speed, slip speed, slip and rotor current frequency for this condition.

   b) Draw neat diagram of DOL starter and explain its operation.

   c) Compare star-star and delta-delta three phase transformer connections.

   d) Write disadvantages of poor power factor.

   e) Write short note on electric drive.

5. Solve **any two** : **(2×6=12)**

   a) Explain characteristics of three phase induction motor and compare three phase squirrel cage induction motor with slip ring induction motor.

   b) Power supplied to a 3 phase induction motor is 40 KW and the corresponding stator losses are 1.5 KW. Calculate 1) The total mechanical power developed and rotor 12 R loss when the slip is 0.04 per unit and 2) The efficiency of the motor.

   c) Write short note on :
      1) Capacitor start capacitor run single phase induction motor
      2) Linear induction motor.

SLR-TJ – 150

Seat No.	

Set **Q**

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

Day and Date : Tuesday, 21-11-2017 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 ***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 correct option : **(14×1=14)**

1) 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

2) In case of three phase power measurement if W_1 and W_2 are wattmeter readings then $\sqrt{3}[W_1 - W_2]$ =
   a) total active power
   b) total reactive power
   c) total apparent power
   d) none of the above

3) 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

4) Following is not three phase transformer connection
   a) V – V
   b) T – T
   c) Y – Y
   d) I – I

5) Which of the following connection is best suitable for 3-phase, 4-wire connection ?
   a) delta - delta
   b) star - star
   c) star - delta
   d) none of the above

P.T.O.

6) The main cause of poor power factor is
   a) light loaded induction motor b) induction furnace
   c) arc lamp d) all of the above

7) In case Scott connection for both primary and secondary winding of main transformer consists of _____% tapping.
   a) 50 b) 66.66
   c) 83 d) 58

8) The power factor of a squirrel cage I.M. at no load is approximately =
   a) 0.2 b) 0.5
   c) 0.9 d) 1

9) Running torque of 3 phase induction motor becomes maximum when
   a) R2 = SX2 b) $I_{ST} = I_{FL}$
   c) R2/X2 = 1 d) R2 × X2 = 1

10) For the application traction following motor is not suitable
   a) dc series motor b) dc shunt motor
   c) both motors d) none of the above

11) In a 3 phase induction motor air gap flux is
   a) pulsating b) constant
   c) rotating d) synchronously rotating

12) The synchronous speed of I.M. is
   a) speed of stator flux b) speed of rotor flux
   c) speed of rotor d) speed of motor

13) The dc _____ motor should never be switched ON no load.
   a) series b) shunt
   c) differential compound d) cumulative compound

14) When power factor of three phase load is 0.8 lagging then wattmeter readings are
   a) $W_1 = W_2$ b) $W_1 < W_2$
   c) $W_1 > W_2$ d) $W_1 \neq W_2$

_____

SLR-TJ – 150

Seat No.	

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

Day and Date : Tuesday, 21-11-2017 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. Solve **any four** : **(4×4=16)**
   a) Write short note on electrical energy generation by using wind turbine.
   b) Draw circuit diagram and explain Swinburne's test. What are its limitations ?
   c) Phase voltage and current of star connected inductive load is 150 V and 25 A power factor load is 0.707 (lagging). Assuming three wire system and power is measured by two wattmeters. Find wattmeter readings.
   d) Six pole lap wound shunt motor has 500 conductor in the armature. The resistance of armature path is 0.05 ohm, resistance of shunt field is 25 ohm. Find the speed of the motor when it takes 120 A from dc mains of 100 V, flux per pole is 20 mwb.
   e) Explain electrical braking used for dc shunt motor.

(6×2=12)

3. a) A 4-pole 230 (v), dc series runs at 1000 (rpm) when the load current is 12(A). The motor resistance is 1.8 (ohm). The series field coils now are regrouped from all 4 in series to 2 in series with two parallel paths the line current is 20 A. If the corresponding field weakening is 15% calculate speed of the motor.

   OR

   b) Draw neat diagram of 3-point starter and explain its working for field failure condition.
   c) Derive an expression for power factor of three phase inductive load in terms of wattmeters reading. Draw phaser diagram.

Set Q

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) A 4 pole, 50 (Hz) three phase induction motor running with speed 1440 (rpm). Find synchronous speed, slip speed, slip and rotor current frequency for this condition.

   b) Draw neat diagram of DOL starter and explain its operation.

   c) Compare star-star and delta-delta three phase transformer connections.

   d) Write disadvantages of poor power factor.

   e) Write short note on electric drive.

5. Solve **any two** : **(2×6=12)**

   a) Explain characteristics of three phase induction motor and compare three phase squirrel cage induction motor with slip ring induction motor.

   b) Power supplied to a 3 phase induction motor is 40 KW and the corresponding stator losses are 1.5 KW. Calculate 1) The total mechanical power developed and rotor 12 R loss when the slip is 0.04 per unit and 2) The efficiency of the motor.

   c) Write short note on :
      1) Capacitor start capacitor run single phase induction motor
      2) Linear induction motor.

SLR-TJ – 150

Seat No.	

Set **R**

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

Day and Date : Tuesday, 21-11-2017 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 ***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 correct option : **(14×1=14)**

1) The synchronous speed of I.M. is
   a) speed of stator flux b) speed of rotor flux
   c) speed of rotor d) speed of motor

2) The dc _____ motor should never be switched ON no load.
   a) series b) shunt
   c) differential compound d) cumulative compound

3) When power factor of three phase load is 0.8 lagging then wattmeter readings are
   a) $W_1 = W_2$ b) $W_1 < W_2$
   c) $W_1 > W_2$ d) $W_1 \neq W_2$

4) For dc shunt motor $T \propto I_a$ 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

5) In case of three phase power measurement if W_1 and W_2 are wattmeter readings then $\sqrt{3}\,[W_1 - W_2] =$
   a) total active power b) total reactive power
   c) total apparent power d) none of the above

6) 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

P.T.O.

7) Following is not three phase transformer connection
   a) V – V b) T – T
   c) Y – Y d) I – I

8) Which of the following connection is best suitable for 3-phase, 4-wire connection ?
   a) delta - delta b) star - star
   c) star - delta d) none of the above

9) The main cause of poor power factor is
   a) light loaded induction motor b) induction furnace
   c) arc lamp d) all of the above

10) In case Scott connection for both primary and secondary winding of main transformer consists of _____% tapping.
   a) 50 b) 66.66
   c) 83 d) 58

11) The power factor of a squirrel cage I.M. at no load is approximately =
   a) 0.2 b) 0.5
   c) 0.9 d) 1

12) Running torque of 3 phase induction motor becomes maximum when
   a) R2 = SX2 b) $I_{ST} = I_{FL}$
   c) R2/X2 = 1 d) R2 × X2 = 1

13) For the application traction following motor is not suitable
   a) dc series motor b) dc shunt motor
   c) both motors d) none of the above

14) In a 3 phase induction motor air gap flux is
   a) pulsating b) constant
   c) rotating d) synchronously rotating

_____

SLR-TJ – 150

Seat No.	

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

Day and Date : Tuesday, 21-11-2017 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. Solve **any four** : **(4×4=16)**
   a) Write short note on electrical energy generation by using wind turbine.
   b) Draw circuit diagram and explain Swinburne's test. What are its limitations ?
   c) Phase voltage and current of star connected inductive load is 150 V and 25 A power factor load is 0.707 (lagging). Assuming three wire system and power is measured by two wattmeters. Find wattmeter readings.
   d) Six pole lap wound shunt motor has 500 conductor in the armature. The resistance of armature path is 0.05 ohm, resistance of shunt field is 25 ohm. Find the speed of the motor when it takes 120 A from dc mains of 100 V, flux per pole is 20 mwb.
   e) Explain electrical braking used for dc shunt motor.

(6×2=12)

3. a) A 4-pole 230 (v), dc series runs at 1000 (rpm) when the load current is 12(A). The motor resistance is 1.8 (ohm). The series field coils now are regrouped from all 4 in series to 2 in series with two parallel paths the line current is 20 A. If the corresponding field weakening is 15% calculate speed of the motor.

   OR

   b) Draw neat diagram of 3-point starter and explain its working for field failure condition.
   c) Derive an expression for power factor of three phase inductive load in terms of wattmeters reading. Draw phaser diagram.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) A 4 pole, 50 (Hz) three phase induction motor running with speed 1440 (rpm). Find synchronous speed, slip speed, slip and rotor current frequency for this condition.

   b) Draw neat diagram of DOL starter and explain its operation.

   c) Compare star-star and delta-delta three phase transformer connections.

   d) Write disadvantages of poor power factor.

   e) Write short note on electric drive.

5. Solve **any two** : **(2×6=12)**

   a) Explain characteristics of three phase induction motor and compare three phase squirrel cage induction motor with slip ring induction motor.

   b) Power supplied to a 3 phase induction motor is 40 KW and the corresponding stator losses are 1.5 KW. Calculate 1) The total mechanical power developed and rotor 12 R loss when the slip is 0.04 per unit and 2) The efficiency of the motor.

   c) Write short note on :
      1) Capacitor start capacitor run single phase induction motor
      2) Linear induction motor.

SLR-TJ – 150

Seat No.	

Set **S**

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

Day and Date : Tuesday, 21-11-2017 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 ***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 correct option : **(14×1=14)**

1) 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

2) Following is not three phase transformer connection
   a) V – V b) T – T
   c) Y – Y d) I – I

3) Which of the following connection is best suitable for 3-phase, 4-wire connection ?
   a) delta - delta b) star - star
   c) star - delta d) none of the above

4) The main cause of poor power factor is
   a) light loaded induction motor b) induction furnace
   c) arc lamp d) all of the above

5) In case Scott connection for both primary and secondary winding of main transformer consists of _____% tapping.
   a) 50 b) 66.66 c) 83 d) 58

6) The power factor of a squirrel cage I.M. at no load is approximately =
   a) 0.2 b) 0.5
   c) 0.9 d) 1

P.T.O.

7) Running torque of 3 phase induction motor becomes maximum when
   a) R2 = SX2 b) $I_{ST} = I_{FL}$
   c) R2/X2 = 1 d) R2 × X2 = 1
8) For the application traction following motor is not suitable
   a) dc series motor b) dc shunt motor
   c) both motors d) none of the above
9) In a 3 phase induction motor air gap flux is
   a) pulsating b) constant
   c) rotating d) synchronously rotating
10) The synchronous speed of I.M. is
   a) speed of stator flux b) speed of rotor flux
   c) speed of rotor d) speed of motor
11) The dc _____ motor should never be switched ON no load.
   a) series b) shunt
   c) differential compound d) cumulative compound
12) When power factor of three phase load is 0.8 lagging then wattmeter readings are
   a) $W_1 = W_2$ b) $W_1 < W_2$
   c) $W_1 > W_2$ d) $W_1 \neq W_2$
13) 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
14) In case of three phase power measurement if W_1 and W_2 are wattmeter readings then $\sqrt{3}[W_1 - W_2]$ =
   a) total active power b) total reactive power
   c) total apparent power d) none of the above

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SLR-TJ – 150

Seat No.	

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

Day and Date : Tuesday, 21-11-2017 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. Solve **any four** : **(4×4=16)**
   a) Write short note on electrical energy generation by using wind turbine.
   b) Draw circuit diagram and explain Swinburne's test. What are its limitations ?
   c) Phase voltage and current of star connected inductive load is 150 V and 25 A power factor load is 0.707 (lagging). Assuming three wire system and power is measured by two wattmeters. Find wattmeter readings.
   d) Six pole lap wound shunt motor has 500 conductor in the armature. The resistance of armature path is 0.05 ohm, resistance of shunt field is 25 ohm. Find the speed of the motor when it takes 120 A from dc mains of 100 V, flux per pole is 20 mwb.
   e) Explain electrical braking used for dc shunt motor.

(6×2=12)

3. a) A 4-pole 230 (v), dc series runs at 1000 (rpm) when the load current is 12(A). The motor resistance is 1.8 (ohm). The series field coils now are regrouped from all 4 in series to 2 in series with two parallel paths the line current is 20 A. If the corresponding field weakening is 15% calculate speed of the motor.

   OR

   b) Draw neat diagram of 3-point starter and explain its working for field failure condition.
   c) Derive an expression for power factor of three phase inductive load in terms of wattmeters reading. Draw phaser diagram.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) A 4 pole, 50 (Hz) three phase induction motor running with speed 1440 (rpm). Find synchronous speed, slip speed, slip and rotor current frequency for this condition.

   b) Draw neat diagram of DOL starter and explain its operation.

   c) Compare star-star and delta-delta three phase transformer connections.

   d) Write disadvantages of poor power factor.

   e) Write short note on electric drive.

5. Solve **any two** : **(2×6=12)**

   a) Explain characteristics of three phase induction motor and compare three phase squirrel cage induction motor with slip ring induction motor.

   b) Power supplied to a 3 phase induction motor is 40 KW and the corresponding stator losses are 1.5 KW. Calculate 1) The total mechanical power developed and rotor 12 R loss when the slip is 0.04 per unit and 2) The efficiency of the motor.

   c) Write short note on :
      1) Capacitor start capacitor run single phase induction motor
      2) Linear induction motor.

SLR-TJ – 151

Seat No.	

Set P

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

Day and Date : Wednesday, 22-11-2017 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) Assume suitable data if **required**.*
*4) Figures to **right** indicate **maximum** marks.*
*5) Use of data sheet is **allowed**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer.

1) Direct coupled amplifier is especially used for amplifying
   a) high frequency signal
   b) distorted high frequency square signal
   c) very low frequency signal
   d) distorted high frequency saw tooth signal

2) An amplifier has following critical frequencies: 950 Hz, 1.2 KHz, 8 KHz and 8.5 KHz. Then Bandwidth is
   a) 7550Hz b) 7300Hz c) 6800Hz d) 7050Hz

3) Transformer coupling provides high efficiency because
   a) Collector voltage is stepped up
   b) Dc resistance in the collector circuit is low
   c) Collector voltage is stepped down
   d) Flux linkages are incomplete

4) Emitter follower is a _____ circuit.
   a) Voltage series feedback b) Current series feedback
   c) Current shunt feedback d) Voltage shunt feedback

5) If D = 10%, Av = 40, k = 0.01. Distortion factor with feedback is
   a) 7.4% b) 7.01% c) 7.00% d) 7.14%

6) In CLASS A power amplifier collector current in the output circuit flows for
   a) 180° b) 360°
   c) less than 180° d) greater than 180° and less than 360°
7) Complementary symmetry power amplifier
   a) uses two NPN transistors
   b) uses common base configuration
   c) matched pairs of complementary transistors
   d) uses two PNP transistors
8) Which of the following circuits provides the highest frequency stability,
   a) RC phase shift oscillator b) Colpitt's oscillator
   c) Crystal oscillator d) Hartley oscillator
9) The output voltage of LM-317 as adjustable regulator is
   a) Vo = Vref (1 $\pm$ R2/R1) + IadjR2 b) Vo = Vref (1+R2/R1) + IadjR2
   c) Vo = Vref (R2+R1) + IadjR2 d) Vo = Vref (1+R2/R1) + IadjR1
10) Regulated output voltage of fixed voltage regulator 7812 is
   a) 1.25 V b) 15 V c) 0.25 V d) 12 V
11) Divide by N network can be designed by _____ multivibrator.
   a) Astable b) One shot c) Bistable d) Divider
12) In astable multivibrator using IC – 555 RA = 10 KΩ, RB = 10 KΩ and C = 0.1 μf
   Then the duty cycle of output waveform is
   a) 50% b) 60% c) 33.33% d) 66.67%
13) Pre regulator in voltage regulator acts as
   a) Constant current source b) Reference voltage source
   c) Pre amplifier d) All above
14) In RC phase shift oscillator each R-C network provides _____ phase shift.
   a) 180 degree b) 90 degree c) 60 degree d) 30 degree

_____

SLR-TJ – 151

Seat No.	

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

Day and Date : Wednesday, 22-11-2017 Marks : 56

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

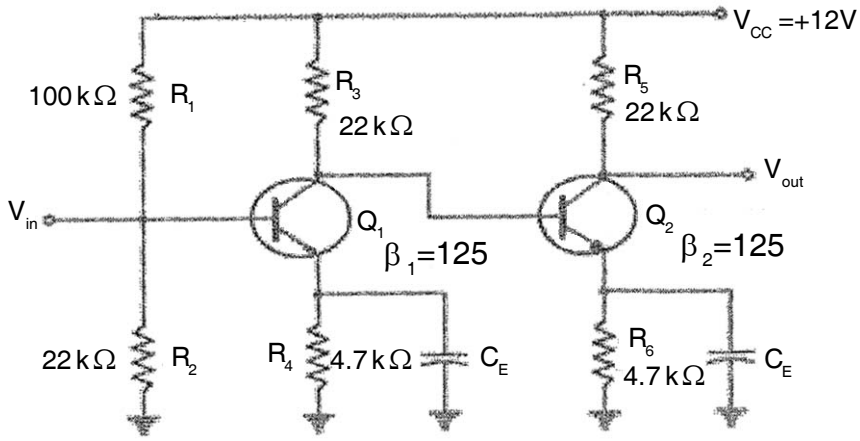
Instructions *:1)* ***All*** *questions are* ***compulsory****.*
2) Assume suitable data if ***required****.*
3) Figures to ***right*** *indicate* ***maximum*** *marks.*
4) Use of data sheet is ***allowed****.*

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) Compare the various method of coupling schemes used in multistage amplifiers.
   2) Explain working of two stage R-C coupled amplifier. Derive an expression for voltage gain.
   3) An amplifier has midband gain of 125 and bandwidth 250 KHz.
      a) If 4% of negative feedback is introduced calculate new bandwidth and gain.
      b) If bandwidth is restricted to 1 MHz. Calculate feedback factor.
   4) Compare feedback amplifiers in following configurations with suitable block diagram
      a) Voltage series feedback
      b) Voltage shunt feedback
      c) Current series feedback
      d) Current shunt feedback
   5) Prove that in case of class B push pull amplifier, the efficiency is 50% at the time of maximum power dissipation.

3. Attempt **any two** : **(2×6=12)**
   1) Design a two stage RC coupled amplifier for overall gain with feedback 90 to meet the following specification R_L (load) = 1 kΩ, Rs = 500Ω, output voltage = $10V_{pp}$, with supply voltage of 12V, lower 3db frequency is 20 Hz, use BC147B. hfe = 220 hie = 4.5 KΩ.
   2) Explain working of class A transformer coupled power amplifier. Derive an expression for its maximum efficiency and power dissipation.

3) For above two stage direct coupled amplifier calculate value of overall voltage gain in dB for following $\beta_1 = \beta_2 = 125$, neglect V_{be}.



SECTION – II

4. Answer **any four** : **(4×4=16)**
   1) List performance parameters of three terminal fixed IC voltage regulators.
   2) Design a circuit to turn ON LED for 15 sec after applying trigger pulse, initially the LED is in off condition.
   3) Design an adjustable voltage regulator using LM-317 to satisfy following Vo = 10 to 30 V, for output current of 1A.
   4) Explain Barkhausen criteria for oscillation. How an amplifier can be converted in to an oscillator ?
   5) Draw and explain crystal oscillator. List different types of material used.

5. Answer **any two** : **(2×6=12)**
   1) Design a transistorized series voltage regulator for 25V at 500 mA. The unregulated power supply provides output of 35V. Select transistor with following specification.
      ECN 100 $PD_{(max)}$ = 5W, hfe = 50
      BC147B $PD_{(max)}$ = 250 mW, hfe = 200
   2) Design a dual tracking regulator using three terminal adjustable IC voltage regulators for following specification :
      i) Vo = ± 05 V to ± 20 V
      ii) Io = 1A
      iii) Vin = 25 V, use R1 = 240 Ω, I_{adj} = 200 μA.
   3) Explain Astable Multivibrator with internal circuitry and derive the expression for frequency and duty cycle.

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Set P

SLR-TJ – 151

Seat No.	

Set Q

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

Day and Date : Wednesday, 22-11-2017 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) Assume suitable data if **required**.*
*4) Figures to **right** indicate **maximum** marks.*
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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer.

1) Which of the following circuits provides the highest frequency stability,
   a) RC phase shift oscillator b) Colpitt's oscillator
   c) Crystal oscillator d) Hartley oscillator

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

3) Regulated output voltage of fixed voltage regulator 7812 is
   a) 1.25 V b) 15 V c) 0.25 V d) 12 V

4) Divide by N network can be designed by _____ multivibrator.
   a) Astable b) One shot c) Bistable d) Divider

5) In astable multivibrator using IC – 555 RA = 10 KΩ, RB = 10 KΩ and C = 0.1 μf Then the duty cycle of output waveform is
   a) 50% b) 60% c) 33.33% d) 66.67%

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

7) In RC phase shift oscillator each R-C network provides _____ phase shift.
   a) 180 degree b) 90 degree c) 60 degree d) 30 degree

8) Direct coupled amplifier is especially used for amplifying
   a) high frequency signal
   b) distorted high frequency square signal
   c) very low frequency signal
   d) distorted high frequency saw tooth signal

9) An amplifier has following critical frequencies: 950 Hz, 1.2 KHz, 8 KHz and 8.5 KHz. Then Bandwidth is
   a) 7550Hz b) 7300Hz c) 6800Hz d) 7050Hz

10) Transformer coupling provides high efficiency because
   a) Collector voltage is stepped up
   b) Dc resistance in the collector circuit is low
   c) Collector voltage is stepped down
   d) Flux linkages are incomplete

11) Emitter follower is a _____ circuit.
   a) Voltage series feedback b) Current series feedback
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12) If D = 10%, Av = 40, k = 0.01. Distortion factor with feedback is
   a) 7.4% b) 7.01% c) 7.00% d) 7.14%

13) In CLASS A power amplifier collector current in the output circuit flows for
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   a) uses two NPN transistors
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SLR-TJ – 151

Seat No.	

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

Day and Date : Wednesday, 22-11-2017 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)**

1) Compare the various method of coupling schemes used in multistage amplifiers.

2) Explain working of two stage R-C coupled amplifier. Derive an expression for voltage gain.

3) An amplifier has midband gain of 125 and bandwidth 250 KHz.

a) If 4% of negative feedback is introduced calculate new bandwidth and gain.

b) If bandwidth is restricted to 1 MHz. Calculate feedback factor.

4) Compare feedback amplifiers in following configurations with suitable block diagram

a) Voltage series feedback

b) Voltage shunt feedback

c) Current series feedback

d) Current shunt feedback

5) Prove that in case of class B push pull amplifier, the efficiency is 50% at the time of maximum power dissipation.

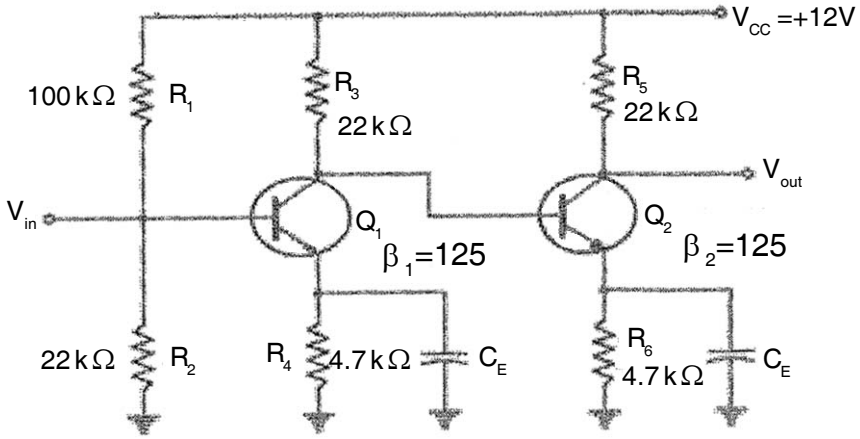
3. Attempt **any two** : **(2×6=12)**

1) Design a two stage RC coupled amplifier for overall gain with feedback 90 to meet the following specification R_L (load) = 1 kΩ, Rs = 500Ω, output voltage = $10V_{pp}$, with supply voltage of 12V, lower 3db frequency is 20 Hz, use BC147B. hfe = 220 hie = 4.5 KΩ.

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

Set Q

3) For above two stage direct coupled amplifier calculate value of overall voltage gain in dB for following $\beta_1 = \beta_2 = 125$, neglect V_{be}.



SECTION – II

4. Answer **any four** : **(4×4=16)**
   1) List performance parameters of three terminal fixed IC voltage regulators.
   2) Design a circuit to turn ON LED for 15 sec after applying trigger pulse, initially the LED is in off condition.
   3) Design an adjustable voltage regulator using LM-317 to satisfy following Vo = 10 to 30 V, for output current of 1A.
   4) Explain Barkhausen criteria for oscillation. How an amplifier can be converted in to an oscillator ?
   5) Draw and explain crystal oscillator. List different types of material used.

5. Answer **any two** : **(2×6=12)**
   1) Design a transistorized series voltage regulator for 25V at 500 mA. The unregulated power supply provides output of 35V. Select transistor with following specification.
      ECN 100 $PD_{(max)}$ = 5W, hfe = 50
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   2) Design a dual tracking regulator using three terminal adjustable IC voltage regulators for following specification :
      i) Vo = ± 05 V to ± 20 V
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Set Q

SLR-TJ – 151

Seat No.	

Set R

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

Day and Date : Wednesday, 22-11-2017 Total Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

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MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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1) If D = 10%, Av = 40, k = 0.01. Distortion factor with feedback is
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2) In CLASS A power amplifier collector current in the output circuit flows for
   a) 180° b) 360°
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3) Complementary symmetry power amplifier
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4) Which of the following circuits provides the highest frequency stability,
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14) Emitter follower is a _____ circuit.
   a) Voltage series feedback b) Current series feedback
   c) Current shunt feedback d) Voltage shunt feedback

_____

SLR-TJ – 151

Seat No.	

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

Day and Date : Wednesday, 22-11-2017 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)**
   1) Compare the various method of coupling schemes used in multistage amplifiers.
   2) Explain working of two stage R-C coupled amplifier. Derive an expression for voltage gain.
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3. Attempt **any two** : **(2×6=12)**
   1) Design a two stage RC coupled amplifier for overall gain with feedback 90 to meet the following specification R_L (load) = 1 kΩ, Rs = 500Ω, output voltage = $10V_{pp}$, with supply voltage of 12V, lower 3db frequency is 20 Hz, use BC147B. hfe = 220 hie = 4.5 KΩ.
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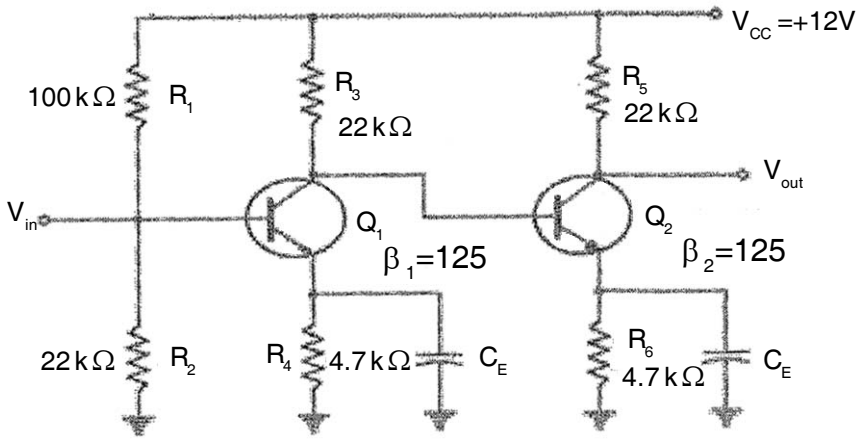

SECTION – II

4. Answer **any four** : **(4×4=16)**
   1) List performance parameters of three terminal fixed IC voltage regulators.
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   3) Design an adjustable voltage regulator using LM-317 to satisfy following Vo = 10 to 30 V, for output current of 1A.
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      BC147B $PD_{(max)}$ = 250 mW, hfe = 200
   2) Design a dual tracking regulator using three terminal adjustable IC voltage regulators for following specification :
      i) Vo = ± 05 V to ± 20 V
      ii) Io = 1A
      iii) Vin = 25 V, use R1 = 240 Ω, I_{adj} = 200 μA.
   3) Explain Astable Multivibrator with internal circuitry and derive the expression for frequency and duty cycle.

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Set R

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Set S

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

Day and Date : Wednesday, 22-11-2017 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) Assume suitable data if **required**.*
*4) Figures to **right** indicate **maximum** marks.*
*5) Use of data sheet is **allowed**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer.

1) Regulated output voltage of fixed voltage regulator 7812 is
   a) 1.25 V b) 15 V c) 0.25 V d) 12 V

2) Divide by N network can be designed by _____ multivibrator.
   a) Astable b) One shot c) Bistable d) Divider

3) In astable multivibrator using IC – 555 RA = 10 KΩ, RB = 10 KΩ and C = 0.1 μf Then the duty cycle of output waveform is
   a) 50% b) 60% c) 33.33% d) 66.67%

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

5) In RC phase shift oscillator each R-C network provides _____ phase shift.
   a) 180 degree b) 90 degree c) 60 degree d) 30 degree

6) Direct coupled amplifier is especially used for amplifying
   a) high frequency signal
   b) distorted high frequency square signal
   c) very low frequency signal
   d) distorted high frequency saw tooth signal

7) An amplifier has following critical frequencies: 950 Hz, 1.2 KHz, 8 KHz and 8.5 KHz. Then Bandwidth is
   a) 7550Hz b) 7300Hz c) 6800Hz d) 7050Hz
8) Transformer coupling provides high efficiency because
   a) Collector voltage is stepped up
   b) Dc resistance in the collector circuit is low
   c) Collector voltage is stepped down
   d) Flux linkages are incomplete
9) Emitter follower is a _____ circuit.
   a) Voltage series feedback b) Current series feedback
   c) Current shunt feedback d) Voltage shunt feedback
10) If D = 10%, Av = 40, k = 0.01. Distortion factor with feedback is
   a) 7.4% b) 7.01% c) 7.00% d) 7.14%
11) In CLASS A power amplifier collector current in the output circuit flows for
   a) 180° b) 360°
   c) less than 180° d) greater than 180° and less than 360°
12) Complementary symmetry power amplifier
   a) uses two NPN transistors
   b) uses common base configuration
   c) matched pairs of complementary transistors
   d) uses two PNP transistors
13) Which of the following circuits provides the highest frequency stability,
   a) RC phase shift oscillator b) Colpitt's oscillator
   c) Crystal oscillator d) Hartley oscillator
14) The output voltage of LM-317 as adjustable regulator is
   a) Vo = Vref (1 $\pm$ R2/R1) + IadjR2 b) Vo = Vref (1+R2/R1) + IadjR2
   c) Vo = Vref (R2+R1) + IadjR2 d) Vo = Vref (1+R2/R1) + IadjR1

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

Day and Date : Wednesday, 22-11-2017 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)**

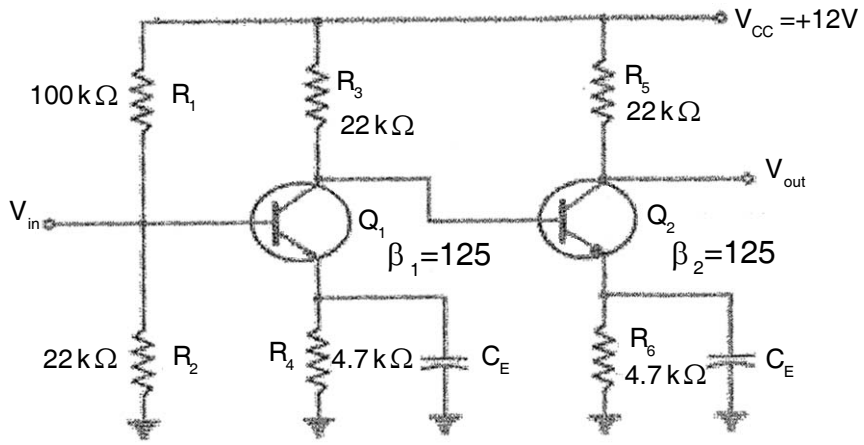
1) Compare the various method of coupling schemes used in multistage amplifiers.
2) Explain working of two stage R-C coupled amplifier. Derive an expression for voltage gain.
3) An amplifier has midband gain of 125 and bandwidth 250 KHz.
   a) If 4% of negative feedback is introduced calculate new bandwidth and gain.
   b) If bandwidth is restricted to 1 MHz. Calculate feedback factor.
4) Compare feedback amplifiers in following configurations with suitable block diagram
   a) Voltage series feedback
   b) Voltage shunt feedback
   c) Current series feedback
   d) Current shunt feedback
5) Prove that in case of class B push pull amplifier, the efficiency is 50% at the time of maximum power dissipation.

3. Attempt **any two** : **(2×6=12)**

1) Design a two stage RC coupled amplifier for overall gain with feedback 90 to meet the following specification R_L (load) = 1 kΩ, Rs = 500Ω, output voltage = $10V_{pp}$, with supply voltage of 12V, lower 3db frequency is 20 Hz, use BC147B. hfe = 220 hie = 4.5 KΩ.
2) Explain working of class A transformer coupled power amplifier. Derive an expression for its maximum efficiency and power dissipation.

Set S

3) For above two stage direct coupled amplifier calculate value of overall voltage gain in dB for following $\beta_1 = \beta_2 = 125$, neglect V_{be}.



SECTION – II

4. Answer **any four** : **(4×4=16)**
   1) List performance parameters of three terminal fixed IC voltage regulators.
   2) Design a circuit to turn ON LED for 15 sec after applying trigger pulse, initially the LED is in off condition.
   3) Design an adjustable voltage regulator using LM-317 to satisfy following Vo = 10 to 30 V, for output current of 1A.
   4) Explain Barkhausen criteria for oscillation. How an amplifier can be converted in to an oscillator ?
   5) Draw and explain crystal oscillator. List different types of material used.

5. Answer **any two** : **(2×6=12)**
   1) Design a transistorized series voltage regulator for 25V at 500 mA. The unregulated power supply provides output of 35V. Select transistor with following specification.
      ECN 100 $PD_{(max)}$ = 5W, hfe = 50
      BC147B $PD_{(max)}$ = 250 mW, hfe = 200
   2) Design a dual tracking regulator using three terminal adjustable IC voltage regulators for following specification :
      i) Vo = ± 05 V to ± 20 V
      ii) Io = 1A
      iii) Vin = 25 V, use R1 = 240 Ω, I_{adj} = 200 μA.
   3) Explain Astable Multivibrator with internal circuitry and derive the expression for frequency and duty cycle.

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Set **P**

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

Day and Date : Thursday, 23-11-2017 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 : **14**

1) In low level AM systems amplifiers following the modulated stages must be
   a) Linear devices b) Harmonic devices
   c) Class C amplifiers d) Non-linear devices

2) The modulation index of an AM WAVE is changed from 0 to 1. The transmitted power is
   a) Unchanged b) Half
   c) Double d) Increases by 50 percent

3) The working principle of balanced modulator is based on
   a) Linearity b) Non-linearity c) PM d) FM

4) Ceramic filters upper limit frequency is
   a) 20 hz b) 20 Khz c) 200 Khz d) 20 Mhz

5) Most of the power in an AM signal is in the
   a) Carrier b) Upper sideband
   c) Lower sideband d) Modulating signal

P.T.O.

6) The Pre-emphasis improves the noise suppression at the receiver by increasing the
   a) Frequency b) Gain
   c) Amplitude d) Modulation Index

7) The difference between pm and FM is
   a) In the poor audio response of phrase modulation
   b) Purely theoretical otherwise the two are modulation
   c) Merely in the different modulation indices
   d) Too great to make the two systems compatible

8) A FM signal with modulation index fed into an FM generator produces a frequency deviation of 2.25 Khz. The modulation index will be
   a) 2.25 b) 4.5 c) 6.77 d) 8.00

9) Calculate the rms noise voltage appearing across a 100 KΩ resistor at 25 degree Celsius temperature and for the effect noise bandwidth of 10 Khz
   a) 12 Hz b) 123 Khz c) 1.28 μV d) 28.1 mV

10) Push button lag pad is provided for Pulse dialing.
   a) True b) False

11) The electromagnetic waves are transverse.
   a) True b) False

12) Power density is defined as
   a) Radiated power per unit area b) Radiated power only
   c) Area only d) Only radiation

13) The polarization of electromagnetic waves
   a) Is always vertical in an isotropic medium
   b) Is caused by reflection
   c) Is due to the transverse nature of waves
   d) Results from the longitude nature of waves

14) The wavelength λ, frequency f and the velocity of light are related to each other by the relation,
   a) $\lambda = f / c$ b) $\lambda fc = 1$ c) $\lambda f = c$ d) $\lambda c = f$

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Seat No.	

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

Day and Date : Thursday, 23-11-2017 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. Answer the following **(any four)** : **(4×4=16)**

a) Compare the High level and Low level modulation.

b) Explain the problems occurring in the TRF receivers ?

c) In a broadcast superheterodyne receiver having no RF amplifier the loaded Q of the antenna coupling circuit is 80. If the intermediate frequency is 455 Khz, Calculate

i) The image frequency and its rejection ratio at 1000 Khz

ii) The image frequency and rejection ratio at 50 Mhz.

d) Derive the expression for equation of AM wave and its instantaneous value of AM signal.

e) Explain the negative feedback circuitry for AM transmitter.

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

1) With circuit diagram explain the Diode detector circuit and also discuss the distortions occurring in it.

2) Derive and explain the average power for sinusoidal AM wave.

3) Explain the block diagram of ISB System.

SECTION – II

4. Answer the following **(any 4)** : **(4×4=16)**

   a) Derive the formulae for instantaneous value of FM voltage and define modulation index.

   b) Differentiate between narrow band and wide band FM.

   c) List and discuss the different tones used in telephony.

   d) Write a note on noise temperature.

   e) With application explain yagi uda antenna.

5. Answer the following **(any 2)** : **(2×6=12)**

   a) Explain the principle of FM generation using direct method. State the merits and demerits of the same.

   b) Explain Time Slot Interchange (TSI) system used in telephony with diagram.

   c) Explain ionospheric wave propagation. Define virtual height, critical frequency and maximum usable frequency.

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Seat No.	

Set Q

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

Day and Date : Thursday, 23-11-2017 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 : **14**

1) A FM signal with modulation index fed into an FM generator produces a frequency deviation of 2.25 Khz. The modulation index will be
   a) 2.25 b) 4.5 c) 6.77 d) 8.00

2) Calculate the rms noise voltage appearing across a 100 KΩ resistor at 25 degree Celsius temperature and for the effect noise bandwidth of 10 Khz
   a) 12 Hz b) 123 Khz c) 1.28 μV d) 28.1 mV

3) Push button lag pad is provided for Pulse dialing.
   a) True b) False

4) The electromagnetic waves are transverse.
   a) True b) False

5) Power density is defined as
   a) Radiated power per unit area b) Radiated power only
   c) Area only d) Only radiation

P.T.O.

6) The polarization of electromagnetic waves
   a) Is always vertical in an isotropic medium
   b) Is caused by reflection
   c) Is due to the transverse nature of waves
   d) Results from the longitude nature of waves

7) The wavelength λ, frequency f and the velocity of light are related to each other by the relation,
   a) $\lambda = f / c$ b) $\lambda fc = 1$ c) $\lambda f = c$ d) $\lambda c = f$

8) In low level AM systems amplifiers following the modulated stages must be
   a) Linear devices b) Harmonic devices
   c) Class C amplifiers d) Non-linear devices

9) The modulation index of an AM WAVE is changed from 0 to 1. The transmitted power is
   a) Unchanged b) Half
   c) Double d) Increases by 50 percent

10) The working principle of balanced modulator is based on
   a) Linearity b) Non-linearity c) PM d) FM

11) Ceramic filters upper limit frequency is
   a) 20 hz b) 20 Khz c) 200 Khz d) 20 Mhz

12) Most of the power in an AM signal is in the
   a) Carrier b) Upper sideband
   c) Lower sideband d) Modulating signal

13) The Pre-emphasis improves the noise suppression at the receiver by increasing the
   a) Frequency b) Gain
   c) Amplitude d) Modulation Index

14) The difference between pm and FM is
   a) In the poor audio response of phrase modulation
   b) Purely theoretical otherwise the two are modulation
   c) Merely in the different modulation indices
   d) Too great to make the two systems compatible

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Seat No.	

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

Day and Date : Thursday, 23-11-2017 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. Answer the following **(any four)** : **(4×4=16)**

a) Compare the High level and Low level modulation.

b) Explain the problems occurring in the TRF receivers ?

c) In a broadcast superheterodyne receiver having no RF amplifier the loaded Q of the antenna coupling circuit is 80. If the intermediate frequency is 455 Khz, Calculate

i) The image frequency and its rejection ratio at 1000 Khz

ii) The image frequency and rejection ratio at 50 Mhz.

d) Derive the expression for equation of AM wave and its instantaneous value of AM signal.

e) Explain the negative feedback circuitry for AM transmitter.

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

1) With circuit diagram explain the Diode detector circuit and also discuss the distortions occurring in it.

2) Derive and explain the average power for sinusoidal AM wave.

3) Explain the block diagram of ISB System.

SECTION – II

4. Answer the following **(any 4)** : **(4×4=16)**

   a) Derive the formulae for instantaneous value of FM voltage and define modulation index.

   b) Differentiate between narrow band and wide band FM.

   c) List and discuss the different tones used in telephony.

   d) Write a note on noise temperature.

   e) With application explain yagi uda antenna.

5. Answer the following **(any 2)** : **(2×6=12)**

   a) Explain the principle of FM generation using direct method. State the merits and demerits of the same.

   b) Explain Time Slot Interchange (TSI) system used in telephony with diagram.

   c) Explain ionospheric wave propagation. Define virtual height, critical frequency and maximum usable frequency.

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Seat No.	

Set **R**

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

Day and Date : Thursday, 23-11-2017 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 : **14**

1) Most of the power in an AM signal is in the
   a) Carrier b) Upper sideband
   c) Lower sideband d) Modulating signal

2) The Pre-emphasis improves the noise suppression at the receiver by increasing the
   a) Frequency b) Gain
   c) Amplitude d) Modulation Index

3) The difference between pm and FM is
   a) In the poor audio response of phrase modulation
   b) Purely theoretical otherwise the two are modulation
   c) Merely in the different modulation indices
   d) Too great to make the two systems compatible

4) A FM signal with modulation index fed into an FM generator produces a frequency deviation of 2.25 Khz. The modulation index will be
   a) 2.25 b) 4.5 c) 6.77 d) 8.00

5) Calculate the rms noise voltage appearing across a 100 KΩ resistor at 25 degree Celsius temperature and for the effect noise bandwidth of 10 Khz

a) 12 Hz b) 123 Khz c) 1.28 μV d) 28.1 mV

6) Push button lag pad is provided for Pulse dialing.

a) True b) False

7) The electromagnetic waves are transverse.

a) True b) False

8) Power density is defined as

a) Radiated power per unit area b) Radiated power only
c) Area only d) Only radiation

9) The polarization of electromagnetic waves

a) Is always vertical in an isotropic medium
b) Is caused by reflection
c) Is due to the transverse nature of waves
d) Results from the longitude nature of waves

10) The wavelength λ, frequency f and the velocity of light are related to each other by the relation,

a) $\lambda = f / c$ b) $\lambda fc = 1$ c) $\lambda f = c$ d) $\lambda c = f$

11) In low level AM systems amplifiers following the modulated stages must be

a) Linear devices b) Harmonic devices
c) Class C amplifiers d) Non-linear devices

12) The modulation index of an AM WAVE is changed from 0 to 1. The transmitted power is

a) Unchanged b) Half
c) Double d) Increases by 50 percent

13) The working principle of balanced modulator is based on

a) Linearity b) Non-linearity c) PM d) FM

14) Ceramic filters upper limit frequency is

a) 20 hz b) 20 Khz c) 200 Khz d) 20 Mhz

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Seat No.	

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

Day and Date : Thursday, 23-11-2017 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. Answer the following **(any four)** : **(4×4=16)**

a) Compare the High level and Low level modulation.

b) Explain the problems occurring in the TRF receivers ?

c) In a broadcast superheterodyne receiver having no RF amplifier the loaded Q of the antenna coupling circuit is 80. If the intermediate frequency is 455 Khz, Calculate

i) The image frequency and its rejection ratio at 1000 Khz

ii) The image frequency and rejection ratio at 50 Mhz.

d) Derive the expression for equation of AM wave and its instantaneous value of AM signal.

e) Explain the negative feedback circuitry for AM transmitter.

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

1) With circuit diagram explain the Diode detector circuit and also discuss the distortions occurring in it.

2) Derive and explain the average power for sinusoidal AM wave.

3) Explain the block diagram of ISB System.

SECTION – II

4. Answer the following **(any 4)** : **(4×4=16)**

   a) Derive the formulae for instantaneous value of FM voltage and define modulation index.

   b) Differentiate between narrow band and wide band FM.

   c) List and discuss the different tones used in telephony.

   d) Write a note on noise temperature.

   e) With application explain yagi uda antenna.

5. Answer the following **(any 2)** : **(2×6=12)**

   a) Explain the principle of FM generation using direct method. State the merits and demerits of the same.

   b) Explain Time Slot Interchange (TSI) system used in telephony with diagram.

   c) Explain ionospheric wave propagation. Define virtual height, critical frequency and maximum usable frequency.

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Seat No.	

Set S

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

Day and Date : Thursday, 23-11-2017 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 : **14**

1) Push button lag pad is provided for Pulse dialing.
   a) True b) False

2) The electromagnetic waves are transverse.
   a) True b) False

3) Power density is defined as
   a) Radiated power per unit area b) Radiated power only
   c) Area only d) Only radiation

4) The polarization of electromagnetic waves
   a) Is always vertical in an isotropic medium
   b) Is caused by reflection
   c) Is due to the transverse nature of waves
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5) The wavelength λ, frequency f and the velocity of light are related to each other by the relation,
   a) $\lambda = f / c$ b) $\lambda fc = 1$ c) $\lambda f = c$ d) $\lambda c = f$

P.T.O.

6) In low level AM systems amplifiers following the modulated stages must be
   a) Linear devices
   b) Harmonic devices
   c) Class C amplifiers
   d) Non-linear devices

7) The modulation index of an AM WAVE is changed from 0 to 1. The transmitted power is
   a) Unchanged
   b) Half
   c) Double
   d) Increases by 50 percent

8) The working principle of balanced modulator is based on
   a) Linearity b) Non-linearity c) PM d) FM

9) Ceramic filters upper limit frequency is
   a) 20 hz b) 20 Khz c) 200 Khz d) 20 Mhz

10) Most of the power in an AM signal is in the
   a) Carrier
   b) Upper sideband
   c) Lower sideband
   d) Modulating signal

11) The Pre-emphasis improves the noise suppression at the receiver by increasing the
   a) Frequency
   b) Gain
   c) Amplitude
   d) Modulation Index

12) The difference between pm and FM is
   a) In the poor audio response of phrase modulation
   b) Purely theoretical otherwise the two are modulation
   c) Merely in the different modulation indices
   d) Too great to make the two systems compatible

13) A FM signal with modulation index fed into an FM generator produces a frequency deviation of 2.25 Khz. The modulation index will be
   a) 2.25 b) 4.5 c) 6.77 d) 8.00

14) Calculate the rms noise voltage appearing across a 100 KΩ resistor at 25 degree Celsius temperature and for the effect noise bandwidth of 10 Khz
   a) 12 Hz b) 123 Khz c) 1.28 μV d) 28.1 mV

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Seat No.	

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

Day and Date : Thursday, 23-11-2017 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. Answer the following **(any four)** : **(4×4=16)**

a) Compare the High level and Low level modulation.

b) Explain the problems occurring in the TRF receivers ?

c) In a broadcast superheterodyne receiver having no RF amplifier the loaded Q of the antenna coupling circuit is 80. If the intermediate frequency is 455 Khz, Calculate

i) The image frequency and its rejection ratio at 1000 Khz

ii) The image frequency and rejection ratio at 50 Mhz.

d) Derive the expression for equation of AM wave and its instantaneous value of AM signal.

e) Explain the negative feedback circuitry for AM transmitter.

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

1) With circuit diagram explain the Diode detector circuit and also discuss the distortions occurring in it.

2) Derive and explain the average power for sinusoidal AM wave.

3) Explain the block diagram of ISB System.

SECTION – II

4. Answer the following **(any 4)** : **(4×4=16)**

   a) Derive the formulae for instantaneous value of FM voltage and define modulation index.

   b) Differentiate between narrow band and wide band FM.

   c) List and discuss the different tones used in telephony.

   d) Write a note on noise temperature.

   e) With application explain yagi uda antenna.

5. Answer the following **(any 2)** : **(2×6=12)**

   a) Explain the principle of FM generation using direct method. State the merits and demerits of the same.

   b) Explain Time Slot Interchange (TSI) system used in telephony with diagram.

   c) Explain ionospheric wave propagation. Define virtual height, critical frequency and maximum usable frequency.

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Seat No.	

Set **P**

S.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Friday, 24-11-2017 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) Which of below is called flat filter ?
a) Chebeshev b) Butterworth c) Elliptical d) Cauer

2) Capture range of a PLL is
a) Greater than lock range b) Less than lock range
c) Equal to the lock range d) None of these

3) Input impedance of an inverting amplifier is approximately equal to
a) Ri b) R1 c) Ri + R1 d) Ri(1 + A β)

4) A certain Op-Amp has bias currents of 50 μ A. The input offset current is
a) 700 nA b) 99.3 μ A c) 75 μ A d) None of these

5) Phase plot for new Op-Amp are not included in data sheet because
a) Phase shift is less than 90
b) There is no phase shift
c) Zero offset voltage
d) Very high slew rate

6) An analog signal is converted into a discrete signal by
a) ADC b) Sample and hold
c) Integrator d) Anti aliasing filter

P.T.O.

7) In a typical sample and hold circuit _____ samples and _____ holds respectively.
   a) Capacitor, MOSFET
   b) MOSFET, Capacitor
   c) OP-Amp, MOSFET
   d) OP-Amp, Capacitor

8) The purpose of level shifter in Op-Amp internal circuit is to
   a) Adjust DC voltage
   b) Increase impedance
   c) Provide high gain
   d) Provide output voltage swing

9) Positive half wave rectifier is a
   a) Positive clipper
   b) Negative clipper
   c) Positive clamper
   d) Negative clamper

10) Slew rate do not depend upon
   a) Peak input voltage
   b) Frequency of input signal
   c) Gain of amplifier
   d) None of these

11) Which among the following is an incorrect characteristic of an ideal Op-Amp ?
   a) Infinite CMRR
   b) Zero output resistance
   c) Infinite bandwidth
   d) None of these

12) The Schmitt trigger is a two-state device that is used for
   a) Pulse shaping
   b) Peak detection
   c) Rectification
   d) DC clamping

13) Voltage series feedback amplifier is also called as _____ amplifier.
   a) Non-inverting
   b) Inverting
   c) Positive feedback
   d) Differential

14) Op-Amp is a _____ coupled _____ amplifier.
   a) Capacitor, high gain
   b) Directly, class AB
   c) Directly, high gain
   d) Capacitor, non-linear

_____

SLR-TJ – 153

Seat No.	

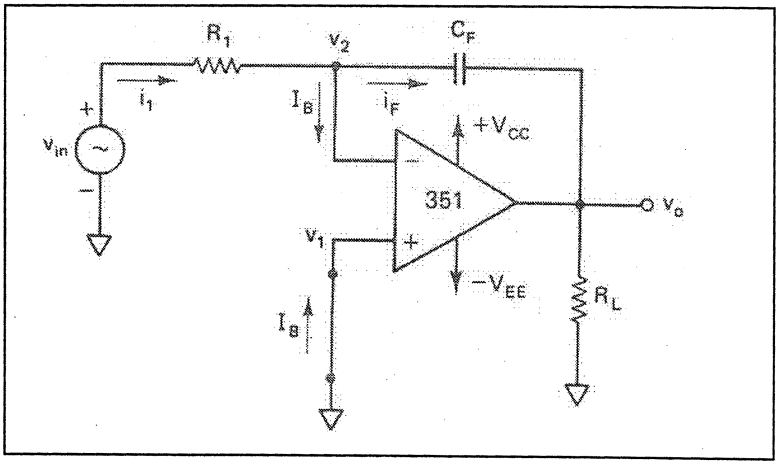
S.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Friday, 24-11-2017 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. Solve **any two** : **(6×2=12)**
   a) Derive expressions for offset voltage compensating network.
   b) What is multistage roll off ? Explain multistage gain (magnitude and phase) as a function of frequency. Also sketch gain as a function of frequency.
   c) For below circuit derive expression for output voltage. Also state the limitations of this circuit and how to overcome it.



3. Solve **any four** : **(4×4=16)**
   a) Evaluate comparator characteristics. Comment how Op-Amp satisfy/non satisfy them.
   b) With suitable example explain how Op-Amp with less slew rate causes distortion with closed loop applications.
   c) Discuss frequency response of a basic differentiator and practical differentiator.
   d) With suitable application example explain non-inverting buffer/voltage follower.
   e) Explain voltage to current converter using Op-Amps with grounded load.

Set P

SECTION – II

4. Solve **any two** : **(6×2=12)**
   a) With suitable diagram analyze working of single slope ADC. Discuss its limitations.
   b) Draw and describe wide band stop filter. Discuss design procedure and comment on component selection.
   c) Show how PLL NE/SE 565 can be used as a frequency multiplier.

5. Solve **any four** : **(4×4=16)**
   a) Explain any two significant DAC specifications.
   b) Analyse a positive peak detector using Op-Amp.
   c) Sketch and explain sawtooth wave generator.
   d) Analyse a notch filter using Op-Amp.
   e) Justify a rectifier designed using Op-Amp is called precision rectifier.

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SLR-TJ – 153

Seat No.	

Set **Q**

S.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Friday, 24-11-2017 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 purpose of level shifter in Op-Amp internal circuit is to
   a) Adjust DC voltage
   b) Increase impedance
   c) Provide high gain
   d) Provide output voltage swing

2) Positive half wave rectifier is a
   a) Positive clipper
   b) Negative clipper
   c) Positive clamper
   d) Negative clamper

3) Slew rate do not depend upon
   a) Peak input voltage
   b) Frequency of input signal
   c) Gain of amplifier
   d) None of these

4) Which among the following is an incorrect characteristic of an ideal Op-Amp ?
   a) Infinite CMRR
   b) Zero output resistance
   c) Infinite bandwidth
   d) None of these

5) The Schmitt trigger is a two-state device that is used for
   a) Pulse shaping b) Peak detection
   c) Rectification d) DC clamping

6) Voltage series feedback amplifier is also called as _____ amplifier.
   a) Non-inverting b) Inverting
   c) Positive feedback d) Differential

7) Op-Amp is a _____ coupled _____ amplifier.
   a) Capacitor, high gain b) Directly, class AB
   c) Directly, high gain d) Capacitor, non-linear

8) Which of below is called flat filter ?
   a) Chebeshev b) Butterworth c) Elliptical d) Cauer

9) Capture range of a PLL is
   a) Greater than lock range b) Less than lock range
   c) Equal to the lock range d) None of these

10) Input impedance of an inverting amplifier is approximately equal to
   a) Ri b) R1 c) Ri + R1 d) $Ri(1 + A\beta)$

11) A certain Op-Amp has bias currents of 50 μ A. The input offset current is
   a) 700 nA b) 99.3 μ A c) 75 μ A d) None of these

12) Phase plot for new Op-Amp are not included in data sheet because
   a) Phase shift is less than 90
   b) There is no phase shift
   c) Zero offset voltage
   d) Very high slew rate

13) An analog signal is converted into a discrete signal by
   a) ADC b) Sample and hold
   c) Integrator d) Anti aliasing filter

14) In a typical sample and hold circuit _____ samples and _____ holds respectively.
   a) Capacitor, MOSFET
   b) MOSFET, Capacitor
   c) OP-Amp, MOSFET
   d) OP-Amp, Capacitor

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SLR-TJ – 153

Seat No.	

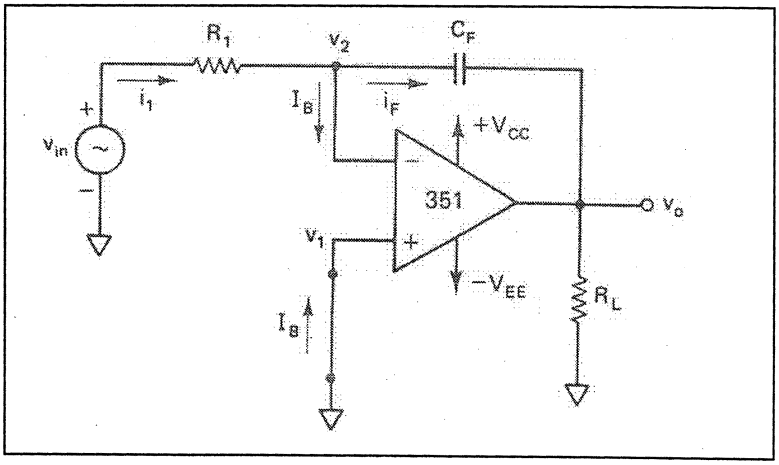
S.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Friday, 24-11-2017 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. Solve **any two** : **(6×2=12)**
   a) Derive expressions for offset voltage compensating network.
   b) What is multistage roll off ? Explain multistage gain (magnitude and phase) as a function of frequency. Also sketch gain as a function of frequency.
   c) For below circuit derive expression for output voltage. Also state the limitations of this circuit and how to overcome it.



3. Solve **any four** : **(4×4=16)**
   a) Evaluate comparator characteristics. Comment how Op-Amp satisfy/non satisfy them.
   b) With suitable example explain how Op-Amp with less slew rate causes distortion with closed loop applications.
   c) Discuss frequency response of a basic differentiator and practical differentiator.
   d) With suitable application example explain non-inverting buffer/voltage follower.
   e) Explain voltage to current converter using Op-Amps with grounded load.

Set Q

SECTION – II

4. Solve **any two** : **(6×2=12)**
   a) With suitable diagram analyze working of single slope ADC. Discuss its limitations.
   b) Draw and describe wide band stop filter. Discuss design procedure and comment on component selection.
   c) Show how PLL NE/SE 565 can be used as a frequency multiplier.

5. Solve **any four** : **(4×4=16)**
   a) Explain any two significant DAC specifications.
   b) Analyse a positive peak detector using Op-Amp.
   c) Sketch and explain sawtooth wave generator.
   d) Analyse a notch filter using Op-Amp.
   e) Justify a rectifier designed using Op-Amp is called precision rectifier.

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SLR-TJ – 153

Seat No.	

Set R

S.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Friday, 24-11-2017 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) Phase plot for new Op-Amp are not included in data sheet because
   a) Phase shift is less than 90
   b) There is no phase shift
   c) Zero offset voltage
   d) Very high slew rate

2) An analog signal is converted into a discrete signal by
   a) ADC
   b) Sample and hold
   c) Integrator
   d) Anti aliasing filter

3) In a typical sample and hold circuit _____ samples and _____ holds respectively.
   a) Capacitor, MOSFET
   b) MOSFET, Capacitor
   c) OP-Amp, MOSFET
   d) OP-Amp, Capacitor

4) The purpose of level shifter in Op-Amp internal circuit is to
   a) Adjust DC voltage
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   c) Provide high gain
   d) Provide output voltage swing

P.T.O.

5) Positive half wave rectifier is a
   a) Positive clipper
   b) Negative clipper
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   d) Negative clamper

6) Slew rate do not depend upon
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   b) Frequency of input signal
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   a) Pulse shaping b) Peak detection
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9) Voltage series feedback amplifier is also called as _____ amplifier.
   a) Non-inverting b) Inverting
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14) A certain Op-Amp has bias currents of 50 μ A. The input offset current is
   a) 700 nA b) 99.3 μ A c) 75 μ A d) None of these

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SLR-TJ – 153

Seat No.	

S.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Friday, 24-11-2017 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. Solve **any two** : **(6×2=12)**
   a) Derive expressions for offset voltage compensating network.
   b) What is multistage roll off ? Explain multistage gain (magnitude and phase) as a function of frequency. Also sketch gain as a function of frequency.
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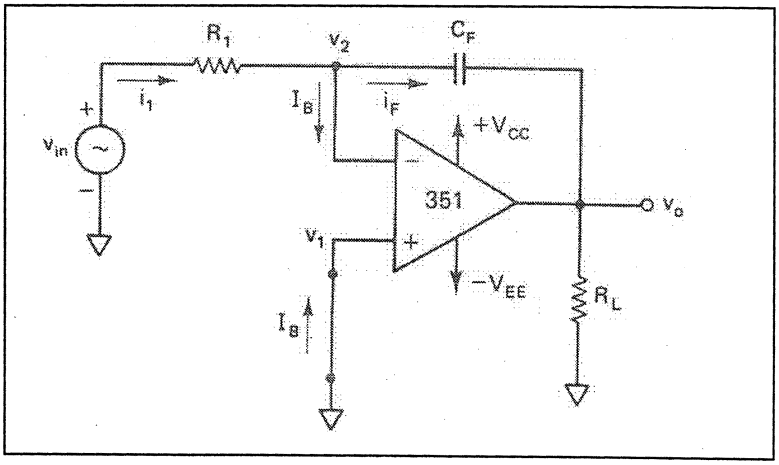

3. Solve **any four** : **(4×4=16)**
   a) Evaluate comparator characteristics. Comment how Op-Amp satisfy/non satisfy them.
   b) With suitable example explain how Op-Amp with less slew rate causes distortion with closed loop applications.
   c) Discuss frequency response of a basic differentiator and practical differentiator.
   d) With suitable application example explain non-inverting buffer/voltage follower.
   e) Explain voltage to current converter using Op-Amps with grounded load.

Set R

SECTION – II

4. Solve **any two** : **(6×2=12)**
   a) With suitable diagram analyze working of single slope ADC. Discuss its limitations.
   b) Draw and describe wide band stop filter. Discuss design procedure and comment on component selection.
   c) Show how PLL NE/SE 565 can be used as a frequency multiplier.

5. Solve **any four** : **(4×4=16)**
   a) Explain any two significant DAC specifications.
   b) Analyse a positive peak detector using Op-Amp.
   c) Sketch and explain sawtooth wave generator.
   d) Analyse a notch filter using Op-Amp.
   e) Justify a rectifier designed using Op-Amp is called precision rectifier.

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SLR-TJ – 153

Seat No.	

Set **S**

S.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Friday, 24-11-2017 Max. Marks : 70
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 : 14

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

1) Slew rate do not depend upon
   a) Peak input voltage
   b) Frequency of input signal
   c) Gain of amplifier
   d) None of these

2) Which among the following is an incorrect characteristic of an ideal Op-Amp ?
   a) Infinite CMRR b) Zero output resistance
   c) Infinite bandwidth d) None of these

3) The Schmitt trigger is a two-state device that is used for
   a) Pulse shaping b) Peak detection
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4) Voltage series feedback amplifier is also called as _____ amplifier.
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P.T.O.

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   a) Positive clipper
   b) Negative clipper
   c) Positive clamper
   d) Negative clamper

_____

SLR-TJ – 153

Seat No.	

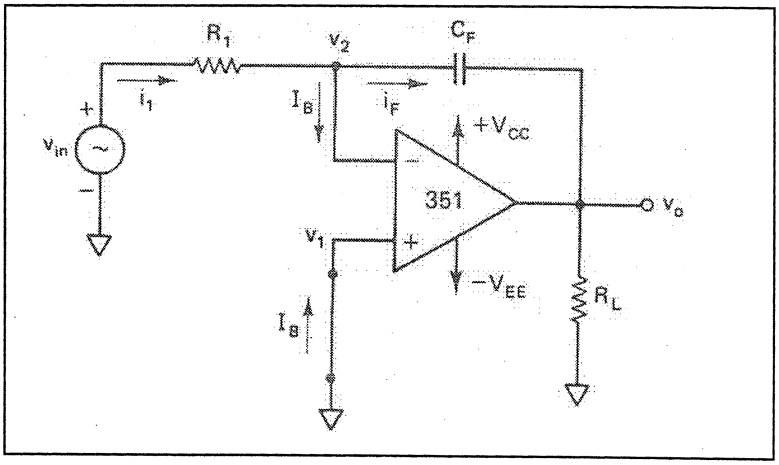
S.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
LINEAR INTEGRATED CIRCUITS

Day and Date : Friday, 24-11-2017 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. Solve **any two** : **(6×2=12)**
   a) Derive expressions for offset voltage compensating network.
   b) What is multistage roll off ? Explain multistage gain (magnitude and phase) as a function of frequency. Also sketch gain as a function of frequency.
   c) For below circuit derive expression for output voltage. Also state the limitations of this circuit and how to overcome it.



3. Solve **any four** : **(4×4=16)**
   a) Evaluate comparator characteristics. Comment how Op-Amp satisfy/non satisfy them.
   b) With suitable example explain how Op-Amp with less slew rate causes distortion with closed loop applications.
   c) Discuss frequency response of a basic differentiator and practical differentiator.
   d) With suitable application example explain non-inverting buffer/voltage follower.
   e) Explain voltage to current converter using Op-Amps with grounded load.

SECTION – II

4. Solve **any two** : **(6×2=12)**
   a) With suitable diagram analyze working of single slope ADC. Discuss its limitations.
   b) Draw and describe wide band stop filter. Discuss design procedure and comment on component selection.
   c) Show how PLL NE/SE 565 can be used as a frequency multiplier.

5. Solve **any four** : **(4×4=16)**
   a) Explain any two significant DAC specifications.
   b) Analyse a positive peak detector using Op-Amp.
   c) Sketch and explain sawtooth wave generator.
   d) Analyse a notch filter using Op-Amp.
   e) Justify a rectifier designed using Op-Amp is called precision rectifier.

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SLR-TJ – 154

Seat No.	

Set P

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

Day and Date : Saturday, 25-11-2017 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 and state the assumptions.

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) $y(t) = x(t) + x(t-100)$ is
   a) Linear b) Casual
   c) Linear and casual d) None

2) If m (t) is an even function, then its trigonometric Fourier representation has
   a) $a_0 = 0$ b) $a_n = 0$ c) $b_n = 0$ d) $a_n = b_n$

3) Fourier transform of unity is
   a) $\delta(w)$ b) $2\pi\delta(w)$
   c) $\pi\delta(w)$ d) Unit step signal

4) If 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) The fundamental period T of the continuous time signal je^{j5t} is
   a) 0.2π sec b) 0.4π sec c) 0.3π sec d) 0.5π sec

6) The output of LTI system with input $x(t) = u(t-3)$ and impulse response $h(t) = \delta(t-1)$ is
   a) $u(t)$ b) $u(t-3)$ c) $u(t-4)$ d) $\delta(t-3)$

7) 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) $e^{j\omega}x(j\omega)$

P.T.O.

8) A function having frequency f is to be sampled. The sampling time T should be

a) $T = \frac{1}{2f}$ b) $T > \frac{1}{2f}$ c) $T < \frac{1}{2f}$ d) $T \geq \frac{1}{2f}$

9) Which of the following is the method used for reconstruction of signal from its samples ?
   a) Zero order hold
   b) Linear interpolation
   c) Both a) and b)
   d) None of these

10) If X (n) is casual finite duration sequence the ROC of X (z) is _____
   a) Entire z plane except $z = \infty$
   b) Entire z plane except $z = 0$
   c) Entire z plane except $z = 0$ and $z = \infty$
   d) Entire z plane

11) A coin is tossed three times, the probability that tail shows at least once is
   a) 7/8 b) 1/8 c) 3/8 d) 1/3

12) 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

13) The autocorrelation function is _____
   a) Odd b) Even c) Both d) None of these

14) If sampling frequency is 1000 Hz, then signal frequency should
   a) ≥ 2000 Hz b) ≥ 1000 Hz c) ≥ 500 Hz d) ≤ 500 Hz

_____

SLR-TJ – 154

Seat No.	

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

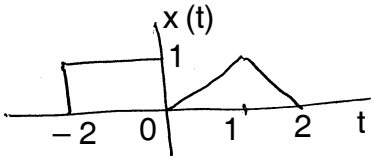
Day and Date : Saturday, 25-11-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Assume suitable data if required and state the assumptions.

SECTION – I

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

a) Consider the signal x (t) as given below.

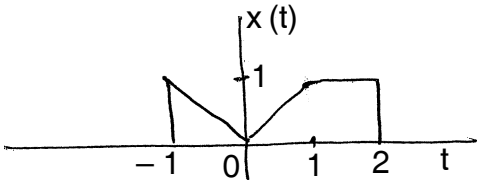


Sketch and label following signals

i) x (t – 1) ii) x (t) u (t + 1)

iii) x (2t + 1) iv) x (t) δ (t – 1)

b) Obtain and sketch the even and odd parts of the continuous time signal x (t) shown below.



c) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period.

i) $3 \cos (3t + \pi / 4)$

ii) $x [n] = \sin(2\pi n / 5 + 2)$

d) State the Exponential Series and derive the expression for computing the coefficients a_0 and a_k exponential Fourier Series.

e) What is an invertible system ? Determine whether the following system is invertible. If it is, construct the inverse system. If it is not find the two input signals to the system that have the same output.
$y (t) = 2x (t – 2)$.

f) State following properties of Fourier transform

i) Time shifting

ii) Differentiation and Integration

iii) Time and Frequency scaling

iv) Convolution

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

a) Compute convolution sum of y [n] = x [n] * h [n] of the following signals

$x[n] = \{1, \underset{\uparrow}{5}, 3, 2\}$ $h[n] = \{2, -\underset{\uparrow}{1}, -3\}$

Sketch the output

b) Determine the Trigonometric Fourier series representation for the following signal

x (t) periodic with period 2 and $x(t) = \begin{cases} -1 & -1 < t < 0 \\ 1 & 0 \le t < 1 \end{cases}$.

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) Define Spectral density and state its properties.

b) Define and sketch following distribution function

i) Uniform distribution

ii) Gaussian distribution

Obtain the expression for mean of Uniform distribution.

c) Explain in brief sample with zero order hold.

d) State the conditions for ROC of system function H (z) of an LTI system for stable system. Obtain impulse response of system if following system is stable

$H(z) = \frac{z}{z - 1/3} + \frac{z}{z - 2}$.

e) The analog signal given below is sampled at 100 samples per second x (t) = 2 sin $(80\pi t)$ + 3 sin $(120\pi t)$

Calculate :

i) Nyquist sampling rate and

ii) The frequencies in radians in the resulting discrete signal x [n].

5. Solve **any two** of the following : **(2×6=12)**

a) State sampling theorem. Explain how to recover exact continuous time signal from its samples using low pass filter with neat diagram.

b) Consider a random variable whose CDF is as below $Fx(x) = (1 - e^{-3x})\, u(x)$

Determine :

i) Probability that $X > 0.6$

ii) Probability that $X \leq 0.25$

iii) Probability that $0.5 < X \leq 0.8$

c) Consider the PDF of a random variable as given below

$f_x(x) = 2(1 - x^2)$ $0 < x < 1$

$= 0$ elsewhere

Determine :

1) Mean value

2) Mean square value

3) Variance of random variable

Set P

SLR-TJ – 154

Seat No.	

Set Q

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

Day and Date : Saturday, 25-11-2017 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 and state the assumptions.

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) A function having frequency f is to be sampled. The sampling time T should be

a) $T = \frac{1}{2f}$ b) $T > \frac{1}{2f}$ c) $T < \frac{1}{2f}$ d) $T \geq \frac{1}{2f}$

2) Which of the following is the method used for reconstruction of signal from its samples ?
a) Zero order hold b) Linear interpolation
c) Both a) and b) d) None of these

3) If X (n) is casual finite duration sequence the ROC of X (z) is _____
a) Entire z plane except z = ∞
b) Entire z plane except z = 0
c) Entire z plane except z = 0 and z = ∞
d) Entire z plane

4) A coin is tossed three times, the probability that tail shows at least once is
a) 7/8 b) 1/8 c) 3/8 d) 1/3

5) 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

6) The autocorrelation function is _____
a) Odd b) Even c) Both d) None of these

7) If sampling frequency is 1000 Hz, then signal frequency should
a) ≥ 2000 Hz b) ≥ 1000 Hz
c) ≥ 500 Hz d) ≤ 500 Hz

P.T.O.

8) $y(t) = x(t) + x(t-100)$ is
   a) Linear
   b) Casual
   c) Linear and casual
   d) None

9) If m (t) is an even function, then its trigonometric Fourier representation has
   a) $a_0 = 0$
   b) $a_n = 0$
   c) $b_n = 0$
   d) $a_n = b_n$

10) Fourier transform of unity is
   a) $\delta(w)$
   b) $2\pi\delta(w)$
   c) $\pi\delta(w)$
   d) Unit step signal

11) If 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) The fundamental period T of the continuous time signal je^{j5t} is
   a) 0.2π sec
   b) 0.4π sec
   c) 0.3π sec
   d) 0.5π sec

13) The output of LTI system with input $x(t) = u(t-3)$ and impulse response $h(t) = \delta(t-1)$ is
   a) $u(t)$
   b) $u(t-3)$
   c) $u(t-4)$
   d) $\delta(t-3)$

14) 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) $e^{j\omega}x(j\omega)$

SLR-TJ – 154

Seat No.	

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

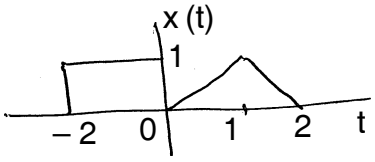
Day and Date : Saturday, 25-11-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Assume suitable data if required and state the assumptions.

SECTION – I

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

a) Consider the signal x (t) as given below.

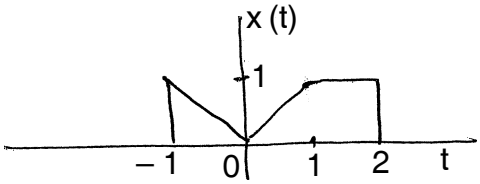


Sketch and label following signals

i) x (t – 1) ii) x (t) u (t + 1)

iii) x (2t + 1) iv) x (t) δ (t – 1)

b) Obtain and sketch the even and odd parts of the continuous time signal x (t) shown below.



c) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period.

i) 3 cos (3t + π / 4)

ii) x [n] = sin(2πn / 5 + 2)

d) State the Exponential Series and derive the expression for computing the coefficients a_0 and a_k exponential Fourier Series.

e) What is an invertible system ? Determine whether the following system is invertible. If it is, construct the inverse system. If it is not find the two input signals to the system that have the same output.
y (t) = 2x (t – 2).

f) State following properties of Fourier transform

i) Time shifting

ii) Differentiation and Integration

iii) Time and Frequency scaling

iv) Convolution

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

a) Compute convolution sum of y [n] = x [n] * h [n] of the following signals

$x[n] = \{1, \underset{\uparrow}{5}, 3, 2\}$ $h[n] = \{2, \underset{\uparrow}{-1}, -3\}$

Sketch the output

b) Determine the Trigonometric Fourier series representation for the following signal

x (t) periodic with period 2 and $x(t) = \begin{cases} -1 & -1 < t < 0 \\ 1 & 0 \le t < 1 \end{cases}$.

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) Define Spectral density and state its properties.

b) Define and sketch following distribution function

i) Uniform distribution

ii) Gaussian distribution

Obtain the expression for mean of Uniform distribution.

c) Explain in brief sample with zero order hold.

d) State the conditions for ROC of system function H (z) of an LTI system for stable system. Obtain impulse response of system if following system is stable

$H(z) = \frac{z}{z - 1/3} + \frac{z}{z - 2}$.

e) The analog signal given below is sampled at 100 samples per second x (t) = 2 sin $(80\pi t)$ + 3 sin $(120\pi t)$

Calculate :

i) Nyquist sampling rate and

ii) The frequencies in radians in the resulting discrete signal x [n].

5. Solve **any two** of the following : **(2×6=12)**

a) State sampling theorem. Explain how to recover exact continuous time signal from its samples using low pass filter with neat diagram.

b) Consider a random variable whose CDF is as below $Fx(x) = (1 - e^{-3x})\, u(x)$

Determine :

i) Probability that $X > 0.6$

ii) Probability that $X \leq 0.25$

iii) Probability that $0.5 < X \leq 0.8$

c) Consider the PDF of a random variable as given below

$f_x(x) = 2(1 - x^2)$ $0 < x < 1$

$= 0$ elsewhere

Determine :

1) Mean value

2) Mean square value

3) Variance of random variable

Set Q

SLR-TJ – 154

Seat No.	

Set R

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

Day and Date : Saturday, 25-11-2017 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 and state the assumptions.

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The fundamental period T of the continuous time signal je^{j5t} is
a) 0.2π sec b) 0.4π sec c) 0.3π sec d) 0.5π sec

2) The output of LTI system with input $x(t) = u(t-3)$ and impulse response $h(t) = \delta(t-1)$ is
a) $u(t)$ b) $u(t-3)$ c) $u(t-4)$ d) $\delta(t-3)$

3) 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) $e^{j\omega}x(j\omega)$

4) A function having frequency f is to be sampled. The sampling time T should be
a) $T = \frac{1}{2f}$ b) $T > \frac{1}{2f}$ c) $T < \frac{1}{2f}$ d) $T \geq \frac{1}{2f}$

5) Which of the following is the method used for reconstruction of signal from its samples ?
a) Zero order hold b) Linear interpolation
c) Both a) and b) d) None of these

6) If X (n) is casual finite duration sequence the ROC of X (z) is _____
a) Entire z plane except $z = \infty$
b) Entire z plane except z = 0
c) Entire z plane except z = 0 and $z = \infty$
d) Entire z plane

P.T.O.

7) A coin is tossed three times, the probability that tail shows at least once is
   a) 7/8 b) 1/8 c) 3/8 d) 1/3

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

9) The autocorrelation function is _____
   a) Odd b) Even c) Both d) None of these

10) If sampling frequency is 1000 Hz, then signal frequency should
   a) ≥ 2000 Hz b) ≥ 1000 Hz c) ≥ 500 Hz d) ≤ 500 Hz

11) y (t) = x (t) + x (t – 100) is
   a) Linear b) Casual
   c) Linear and casual d) None

12) If m (t) is an even function, then its trigonometric Fourier representation has
   a) $a_0 = 0$ b) $a_n = 0$ c) $b_n = 0$ d) $a_n = b_n$

13) Fourier transform of unity is
   a) $\delta(w)$ b) $2\pi\delta(w)$
   c) $\pi\delta(w)$ d) Unit step signal

14) If 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

_____

SLR-TJ – 154

Seat No.	

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

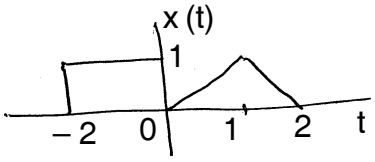
Day and Date : Saturday, 25-11-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Assume suitable data if required and state the assumptions.

SECTION – I

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

a) Consider the signal x (t) as given below.

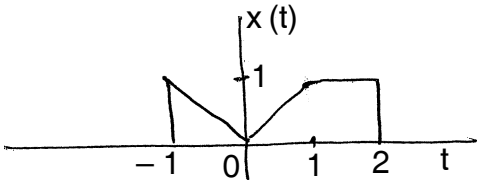


Sketch and label following signals

i) x (t – 1) ii) x (t) u (t + 1)

iii) x (2t + 1) iv) x (t) δ (t – 1)

b) Obtain and sketch the even and odd parts of the continuous time signal x (t) shown below.



c) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period.

i) $3 \cos (3t + \pi / 4)$

ii) $x [n] = \sin(2\pi n / 5 + 2)$

d) State the Exponential Series and derive the expression for computing the coefficients a_0 and a_k exponential Fourier Series.

e) What is an invertible system ? Determine whether the following system is invertible. If it is, construct the inverse system. If it is not find the two input signals to the system that have the same output.
$y (t) = 2x (t – 2)$.

f) State following properties of Fourier transform

i) Time shifting

ii) Differentiation and Integration

iii) Time and Frequency scaling

iv) Convolution

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

a) Compute convolution sum of y [n] = x [n] * h [n] of the following signals

$x[n] = \{1, \underset{\uparrow}{5}, 3, 2\}$ $h[n] = \{2, \underset{\uparrow}{-1}, -3\}$

Sketch the output

b) Determine the Trigonometric Fourier series representation for the following signal

x (t) periodic with period 2 and $x(t) = \begin{cases} -1 & -1 < t < 0 \\ 1 & 0 \le t < 1 \end{cases}$.

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) Define Spectral density and state its properties.

b) Define and sketch following distribution function

i) Uniform distribution

ii) Gaussian distribution

Obtain the expression for mean of Uniform distribution.

c) Explain in brief sample with zero order hold.

d) State the conditions for ROC of system function H (z) of an LTI system for stable system. Obtain impulse response of system if following system is stable

$H(z) = \frac{z}{z - 1/3} + \frac{z}{z - 2}$.

e) The analog signal given below is sampled at 100 samples per second x (t) = 2 sin $(80\pi t)$ + 3 sin $(120\pi t)$

Calculate :

i) Nyquist sampling rate and

ii) The frequencies in radians in the resulting discrete signal x [n].

5. Solve **any two** of the following : **(2×6=12)**

a) State sampling theorem. Explain how to recover exact continuous time signal from its samples using low pass filter with neat diagram.

b) Consider a random variable whose CDF is as below $Fx(x) = (1 - e^{-3x})\, u(x)$

Determine :

i) Probability that $X > 0.6$

ii) Probability that $X \leq 0.25$

iii) Probability that $0.5 < X \leq 0.8$

c) Consider the PDF of a random variable as given below

$f_x(x) = 2(1 - x^2)$ $0 < x < 1$

$= 0$ elsewhere

Determine :

1) Mean value

2) Mean square value

3) Variance of random variable

Set R

SLR-TJ – 154

Seat No.	

Set S

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

Day and Date : Saturday, 25-11-2017 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 and state the assumptions.

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) If X (n) is casual finite duration sequence the ROC of X (z) is _____
   a) Entire z plane except z = ∞
   b) Entire z plane except z = 0
   c) Entire z plane except z = 0 and z = ∞
   d) Entire z plane

2) A coin is tossed three times, the probability that tail shows at least once is
   a) 7/8 b) 1/8 c) 3/8 d) 1/3

3) 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

4) The autocorrelation function is _____
   a) Odd b) Even c) Both d) None of these

5) If sampling frequency is 1000 Hz, then signal frequency should
   a) $\geq$ 2000 Hz b) $\geq$ 1000 Hz c) $\geq$ 500 Hz d) $\leq$ 500 Hz

6) y (t) = x (t) + x (t – 100) is
   a) Linear b) Casual
   c) Linear and casual d) None

7) If m (t) is an even function, then its trigonometric Fourier representation has
   a) $a_0 = 0$ b) $a_n = 0$
   c) $b_n = 0$ d) $a_n = b_n$

8) Fourier transform of unity is
   a) $\delta(w)$ b) $2\pi\delta(w)$
   c) $\pi\delta(w)$ d) Unit step signal

P.T.O.

9) If 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
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10) The fundamental period T of the continuous time signal je^{j5t} is
   a) 0.2π sec
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11) The output of LTI system with input $x(t) = u(t-3)$ and impulse response $h(t) = \delta(t-1)$ is
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   c) $u(t-4)$
   d) $\delta(t-3)$

12) Fourier transform of $\frac{dx(t)}{dt}$ is
   a) $x(j\omega)$
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13) A function having frequency f is to be sampled. The sampling time T should be
   a) $T = \frac{1}{2f}$
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   c) $T < \frac{1}{2f}$
   d) $T \geq \frac{1}{2f}$

14) Which of the following is the method used for reconstruction of signal from its samples ?
   a) Zero order hold
   b) Linear interpolation
   c) Both a) and b)
   d) None of these

———————

SLR-TJ – 154

Seat No.	

S.E. (Electronics Engineering) (Part – II) Examination, 2017
SIGNALS AND SYSTEMS (CGPA)

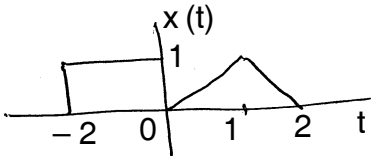
Day and Date : Saturday, 25-11-2017 Marks : 56
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Assume suitable data if required and state the assumptions.

SECTION – I

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

a) Consider the signal x (t) as given below.



Sketch and label following signals

i) x (t – 1) ii) x (t) u (t + 1)

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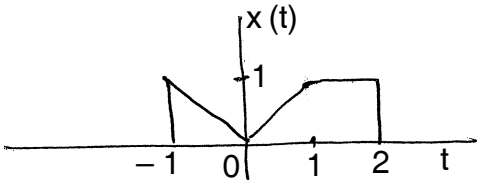
b) Obtain and sketch the even and odd parts of the continuous time signal x (t) shown below.



c) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period.

i) $3 \cos (3t + \pi / 4)$

ii) $x [n] = \sin(2\pi n / 5 + 2)$

d) State the Exponential Series and derive the expression for computing the coefficients a_0 and a_k exponential Fourier Series.

e) What is an invertible system ? Determine whether the following system is invertible. If it is, construct the inverse system. If it is not find the two input signals to the system that have the same output.
$y (t) = 2x (t – 2)$.

f) State following properties of Fourier transform

i) Time shifting

ii) Differentiation and Integration

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iv) Convolution

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

a) Compute convolution sum of y [n] = x [n] * h [n] of the following signals

$x[n] = \{1, \underset{\uparrow}{5}, 3, 2\}$ $h[n] = \{2, \underset{\uparrow}{-1}, -3\}$

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b) Determine the Trigonometric Fourier series representation for the following signal

x (t) periodic with period 2 and $x(t) = \begin{cases} -1 & -1 < t < 0 \\ 1 & 0 \le t < 1 \end{cases}$.

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) Define Spectral density and state its properties.

b) Define and sketch following distribution function

i) Uniform distribution

ii) Gaussian distribution

Obtain the expression for mean of Uniform distribution.

c) Explain in brief sample with zero order hold.

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e) The analog signal given below is sampled at 100 samples per second x (t) = 2 sin $(80\pi t)$ + 3 sin $(120\pi t)$

Calculate :

i) Nyquist sampling rate and

ii) The frequencies in radians in the resulting discrete signal x [n].

5. Solve **any two** of the following : **(2×6=12)**

a) State sampling theorem. Explain how to recover exact continuous time signal from its samples using low pass filter with neat diagram.

b) Consider a random variable whose CDF is as below $Fx(x) = (1 - e^{-3x}) u(x)$

Determine :

i) Probability that $X > 0.6$

ii) Probability that $X \leq 0.25$

iii) Probability that $0.5 < X \leq 0.8$

c) Consider the PDF of a random variable as given below

$f_x(x) = 2(1 - x^2)$ $0 < x < 1$

$= 0$ elsewhere

Determine :

1) Mean value

2) Mean square value

3) Variance of random variable

Set S

SLR-TJ – 155

Seat No.	

Set P

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

Day and Date : Wednesday, 29-11-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

N.B. : *1) Figures to the **right** indicates **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 : **14**

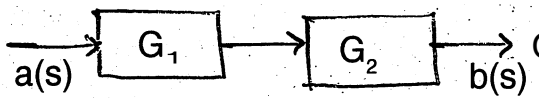
1) Missile launching and guidance system is the example of _____ system.
   a) Feedback control b) Open loop control
   c) Both a) and b) d) None of these

2) When damping factor $\delta = 1$, then system is
   a) Over damped b) Critically damped
   c) Under damped d) None of these

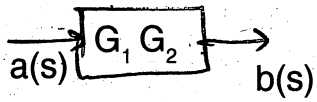
3) Which of the following can work as error detecting device ?
   a) A pair of synchro b) A metadyne
   c) Control transformer d) DC motor

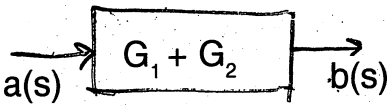
4) Unit impulse response of a system in Laplace transform gives
   a) Transfer function b) System gain
   c) Unit step function d) Unit ramp function

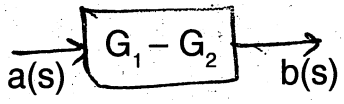
P.T.O.

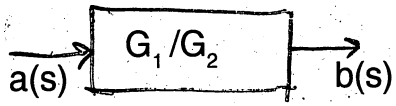
5) 

Can be replaced by

a) 

b) 

c) 

d) 

6) Synchro transmitter-receiver unit is a
   a) D.C. device
   b) 1ϕ A. C. device
   c) 2ϕ A.C. device
   d) 3ϕ A.C. device

7) $G(s) = \frac{2}{s(s+1)}$ find the type of system.
   a) type 0 b) type 1 c) type 2 d) a) and b)

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

9) The phase cross over frequency is the point on frequency axis of the system at which the phase plot of $G(j\omega)$ is intersecting at _____ line.
   a) – 90° b) – 180° c) – 270° d) – 360°

10) For $G(s) = \frac{K}{s(s+1)(s+2)(s+3)}$ the numbers of asymptotes are
   a) 1 b) 2 c) 3 d) 4

11) In polar plot, if $\omega_{gc} < \omega_{pc}$ the system is
   a) stable b) unstable c) marginally stable d) none of these

12) For a system with characteristic equation $F(s) = s^2 + 16s + 64 = 0$ is stable because
   a) order of the system is two
   b) roots of equation are same
   c) roots of equation are negative
   d) none of the above

13) The point at which the root loci breaks away is called
   a) break down point
   b) break away point
   c) break in point
   d) break off point

14) Lag compensator reduces
   a) band width
   b) rise time
   c) transient response
   d) all of above

_____

SLR-TJ – 155

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

Day and Date : Wednesday, 29-11-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

N.B. *: 1) Figures to the **right** indicates **full** marks.*
*2) **Assume** data, if **necessary**.*
*3) **All** questions are **compulsory**.*

SECTION – I

2. Solve **any four** (**each four** marks) : **16**

a) Explain Transfer Function op. Armature controlled D. C. Motor.

b) Explain what is control system and its types. Also explain poles, zeros and time constant form.

c) Find Transfer Function of series R-L circuit.

d) Explain potentiometer as an error detector.

e) Derive response of I order system to unit step input.

3. Solve **any two** (**6** marks **each**) : **12**

a) Write down Rules for Block diagram reduction to find over all transfer function.

b) Determine position velocity and acceleration constant for unity feedback control system with open loop transfer function.

$$G(s) = \frac{50}{(1+0.15s)(1+2s)}.$$

c) Derive the relation for peak time of II order system.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Using Herwitz's criterion determine satiability of the following system

   $$T(s) = \frac{K}{s^3 + s^2 + s + 4}.$$

   b) State advantages and limitations of frequency domain analysis.

   c) What is polar plot ? Draw polar plot for type two system.

   d) Determine angle of asymptote and centroid for transfer function given bellow

   $$G(s)\,H(s) = \frac{K}{s(s^2 + 2s + 2)}.$$

   e) What is compensator ? Explain lag type compensator.

   f) Explain gain cross over frequency, phase cross over frequency, gain margin and phase margin.

5. Solve **any two** : **(2×6=12)**

   a) Sketch the bode plot for following system and determine gain cross over frequency, phase cross over frequency $G(s) = \frac{80}{s(s+2)\,(s+20)}\,H(s) = 1.$

   b) Explain the rules for sketching the root locus.

   c) Find the range of K for satiability of

   $F(s) = 2s^4 + 2s^3 + 2s^2 + (3 + k)s + k = 0.$

SLR-TJ – 155

Seat No.	

Set Q

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

Day and Date : Wednesday, 29-11-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

N.B. : *1) Figures to the **right** indicates **full** marks.*
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*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 : **14**

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

2) The phase cross over frequency is the point on frequency axis of the system at which the phase plot of $G(j\omega)$ is intersecting at _____ line.
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3) For $G(s) = \dfrac{K}{s(s+1)(s+2)(s+3)}$ the numbers of asymptotes are
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P.T.O.

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8) Missile launching and guidance system is the example of _____ system.
   a) Feedback control b) Open loop control
   c) Both a) and b) d) None of these

9) When damping factor $\delta = 1$, then system is
   a) Over damped b) Critically damped
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10) Which of the following can work as error detecting device ?
   a) A pair of synchro b) A metadyne
   c) Control transformer d) DC motor

11) Unit impulse response of a system in Laplace transform gives
   a) Transfer function b) System gain
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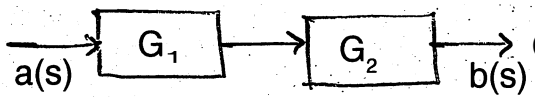
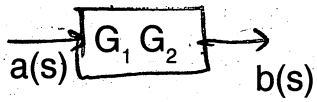
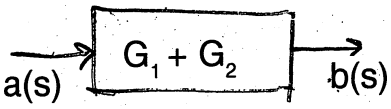
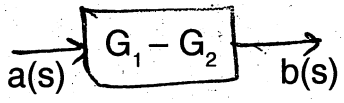
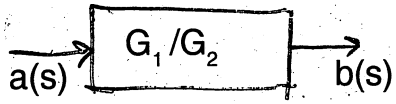
12) 

Can be replaced by

   a) 

   b) 

   c) 

   d) 

13) Synchro transmitter-receiver unit is a
   a) D.C. device b) 1ϕ A. C. device
   c) 2ϕ A.C. device d) 3ϕ A.C. device

14) $G(s) = \dfrac{2}{s(s+1)}$ find the type of system.
   a) type 0 b) type 1 c) type 2 d) a) and b)

_____

SLR-TJ – 155

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

Day and Date : Wednesday, 29-11-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

N.B. *: 1) Figures to the **right** indicates **full** marks.*
*2) **Assume** data, if **necessary**.*
*3) **All** questions are **compulsory**.*

SECTION – I

2. Solve **any four** (**each four** marks) : **16**

a) Explain Transfer Function op. Armature controlled D. C. Motor.

b) Explain what is control system and its types. Also explain poles, zeros and time constant form.

c) Find Transfer Function of series R-L circuit.

d) Explain potentiometer as an error detector.

e) Derive response of I order system to unit step input.

3. Solve **any two** (**6** marks **each**) : **12**

a) Write down Rules for Block diagram reduction to find over all transfer function.

b) Determine position velocity and acceleration constant for unity feedback control system with open loop transfer function.

$$G(s) = \frac{50}{(1+0.15s)(1+2s)}.$$

c) Derive the relation for peak time of II order system.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Using Herwitz's criterion determine satiability of the following system

   $$T(s) = \frac{K}{s^3 + s^2 + s + 4}.$$

   b) State advantages and limitations of frequency domain analysis.

   c) What is polar plot ? Draw polar plot for type two system.

   d) Determine angle of asymptote and centroid for transfer function given bellow

   $$G(s)\,H(s) = \frac{K}{s(s^2 + 2s + 2)}.$$

   e) What is compensator ? Explain lag type compensator.

   f) Explain gain cross over frequency, phase cross over frequency, gain margin and phase margin.

5. Solve **any two** : **(2×6=12)**

   a) Sketch the bode plot for following system and determine gain cross over frequency, phase cross over frequency $G(s) = \frac{80}{s(s+2)\,(s+20)}\,H(s) = 1.$

   b) Explain the rules for sketching the root locus.

   c) Find the range of K for satiability of

   $F(s) = 2s^4 + 2s^3 + 2s^2 + (3 + k)s + k = 0.$

SLR-TJ – 155

Seat No.	

Set R

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

Day and Date : Wednesday, 29-11-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

N.B. : 1) *Figures to the **right** indicates **full** marks.*
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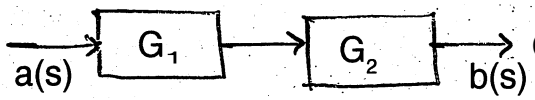
3) ***All** questions are **compulsory**.*
4) *Q. No. **1** is **compulsory**. It should be solved in **first 30 minutes** in Answer Book Page No. **3**. **Each** question carries **one** mark.*
5) ***Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***

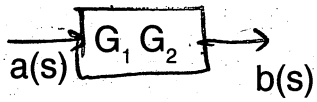
MCQ/Objective Type Questions

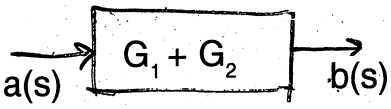
Duration : 30 Minutes Marks : 14

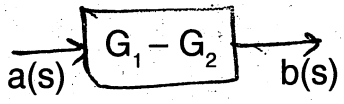
1. Choose the correct answer : **14**

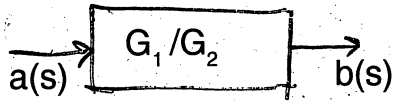
1) 

Can be replaced by

a) 

b) 

c) 

d) 

2) Synchro transmitter-receiver unit is a
   a) D.C. device b) 1ϕ A. C. device
   c) 2ϕ A.C. device d) 3ϕ A.C. device

3) $G(s) = \frac{2}{s(s+1)}$ find the type of system.
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P.T.O.

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

SLR-TJ – 155

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

Day and Date : Wednesday, 29-11-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

N.B. *: 1) Figures to the **right** indicates **full** marks.*
*2) **Assume** data, if **necessary**.*
*3) **All** questions are **compulsory**.*

SECTION – I

2. Solve **any four** (**each four** marks) : **16**

a) Explain Transfer Function op. Armature controlled D. C. Motor.

b) Explain what is control system and its types. Also explain poles, zeros and time constant form.

c) Find Transfer Function of series R-L circuit.

d) Explain potentiometer as an error detector.

e) Derive response of I order system to unit step input.

3. Solve **any two** (**6** marks **each**) : **12**

a) Write down Rules for Block diagram reduction to find over all transfer function.

b) Determine position velocity and acceleration constant for unity feedback control system with open loop transfer function.

$$G(s) = \frac{50}{(1+0.15s)(1+2s)}.$$

c) Derive the relation for peak time of II order system.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Using Herwitz's criterion determine satiability of the following system

   $$T(s) = \frac{K}{s^3 + s^2 + s + 4}.$$

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   a) Sketch the bode plot for following system and determine gain cross over frequency, phase cross over frequency $G(s) = \frac{80}{s(s+2)\,(s+20)}\,H(s) = 1.$

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SLR-TJ – 155

Seat No.	

Set S

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

Day and Date : Wednesday, 29-11-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

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

2) In polar plot, if $\omega_{gc} < \omega_{pc}$ the system is
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P.T.O.

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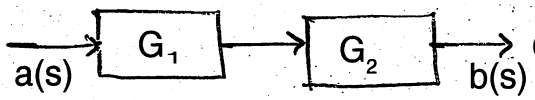
10) 

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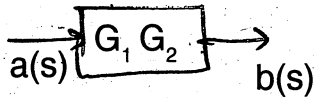
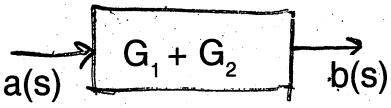
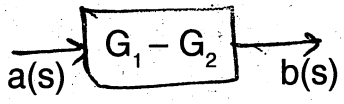
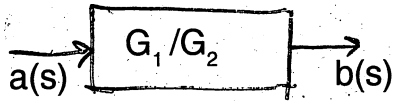
a) 

b) 

c) 

d) 

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_____

SLR-TJ – 155

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
CONTROL SYSTEMS

Day and Date : Wednesday, 29-11-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

N.B. *: 1) Figures to the **right** indicates **full** marks.*
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SECTION – I

2. Solve **any four** (**each four** marks) : **16**

a) Explain Transfer Function op. Armature controlled D. C. Motor.

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$$G(s) = \frac{50}{(1+0.15s)(1+2s)}.$$

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SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Using Herwitz's criterion determine satiability of the following system

   $$T(s) = \frac{K}{s^3 + s^2 + s + 4}.$$

   b) State advantages and limitations of frequency domain analysis.

   c) What is polar plot ? Draw polar plot for type two system.

   d) Determine angle of asymptote and centroid for transfer function given bellow

   $$G(s)\,H(s) = \frac{K}{s(s^2 + 2s + 2)}.$$

   e) What is compensator ? Explain lag type compensator.

   f) Explain gain cross over frequency, phase cross over frequency, gain margin and phase margin.

5. Solve **any two** : **(2×6=12)**

   a) Sketch the bode plot for following system and determine gain cross over frequency, phase cross over frequency $G(s) = \frac{80}{s(s+2)\,(s+20)}\,H(s) = 1.$

   b) Explain the rules for sketching the root locus.

   c) Find the range of K for satiability of

   $F(s) = 2s^4 + 2s^3 + 2s^2 + (3 + k)s + k = 0.$

SLR-TJ – 156

Seat No.	

Set P

T.E. (Electronics Engg.) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Saturday, 02-12-2017 Max. Marks : 70
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 where required.*
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 correct option : **14**

1) A DT signal is
   a) Continuous time continuous amplitude
   b) Continuous time discrete amplitude
   c) Discrete time continuous amplitude
   d) Discreet time discrete amplitude

2) Z-transform reduces to Fourier transform when it is evaluated on
   a) Half circle b) Z circle c) Unit circle d) Imaginary circle

3) The region of convergence of the z-transform of a unit step function is
   a) $|Z| > 1$ b) $|Z| < 1$
   c) (Real part of z) > 0 d) (Real part of z) < 0

4) Number of delay elements are required for direct form I realization of $y(n) = 0.5y(n-1) - 0.25y(n-2) + x(n) + 0.4\,x(n-1)$ are
   a) 1 b) 3 c) 4 d) 2

5) Decimation time FFT decimates
   a) DFT co-efficients b) Input sequence
   c) Both sequence and DFT d) None

P.T.O.

6) The value of the twiddle factor W_4^5 is

a) j b) 1

c) $-0.707 + j0.707$ d) $-j$

7) The DFT of the signal x(n) = {0, 3, 0, – 3}

a) {0, – 2, 0, 2} b) {0, – 6j, 0, 6j}

c) {2, – 6j, 0, 6j} d) {2, – 6j, – 2, 6j}

8) Consider the sum of N numbers each represented by n bits. The maximum number of bits to which the sum grows is

a) (n + N) bits b) $(n+\log_2^N)$ bits

c) $(N+\log_2^n)$ bits d) (n * N) bits

9) In impulse invariant transformation, relation between Ω and ω is

a) $\Omega = \omega T$ b) $\Omega = \omega/T$

c) $\omega = \tan(\Omega T)$ d) $\Omega = (T/2)\tan(\omega T/2)$

10) Which of the following is not true for IIR filters ?

a) Impulse response duration is infinite

b) They have poles

c) They give linear phase response

d) All above

11) For the Butterworth filter with transfer function $H(s) = \frac{s}{s+9}$. The cutoff frequency Ωc is

a) 9 b) 3 c) 1 d) None of these

12) The ideal filters are

a) Causal b) Non causal

c) May be causal or non causal d) None of these

13) The approximate width of the main lobe in rectangular window of length M is

a) $6\pi/M$ b) $8\pi/M$ c) $12\pi/M$ d) $4\pi/M$

14) A Barrel shifter with 16 inputs and left shifts from 0 to 15 requires _____ number of control lines.

a) 4 b) 15 c) 16 d) None of these

SLR-TJ – 156

Seat No.	

T.E. (Electronics Engg.) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Saturday, 02-12-2017 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 where required.*

SECTION – I

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

a) Explain different application areas of DSP.

b) Compute 4 point DFT of DT signal given below :

$X[n] = \{0, 1, 2, 3\}$

c) Consider the FIR filter with impulse response $h(n) = \{1, -2, 4, 5, 3, 1\}$. Draw the structure for realization.

d) Find system function and impulse response of the system described by $y(n) = 1/5\ y(n-1) + x(n)$.

e) Prove that X(k) is real and even when x(n) is real and even where X(k) is DFT of an N-point sequence x(n).

3. Attempt **any two** : **(2×6=12)**

a) Find the circular convolution of following signals $x[n] = \{1, 3, 5, 3\}$ and $h[n] = \{2, 3, 1, 1\}$.

b) State and prove time reversal and circular time shift property of DFT.

c) Explain basic butterfly structure of DIF FFT algorithm. Given $x(n) = n + 1$ and $N = 4$. Find X(k) using DIF 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 impulse invariant method. Assume T = 1s.

   b) Draw and explain the structure for 4 × 4 Baron Multiplier for unsigned numbers.

   c) Design the first order high pass filter with f_c = 1 kHz and sampling frequency f_s = 10000 sps. Use bilinear transformation method.

   d) Explain in detail Multiply and Accumulate (MAC) unit of digital signal processor.

   e) Explain the frequency sampling method for design of FIR filters.

5. Attempt **any two** : **(2×6=12)**

   a) Explain the Bilinear transformation for digital filters in detail.

   b) Explain the applications of DSP in Image Processing and Biomedical field.

   c) The desired frequency response of a low pass filter is

$$Hd(e^{j\omega}) = \begin{cases} e^{-3j\omega} & -\frac{\pi}{2} \le \omega \le \pi/2 \\ 0 & \frac{\pi}{2} \le |\omega| \le \pi \end{cases}$$

   Determine hd(n). Also determine h(n) using symmetric Hamming window with window length 7.

SLR-TJ – 156

Seat No.	

Set Q

T.E. (Electronics Engg.) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Saturday, 02-12-2017 Max. Marks : 70
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 where required.*
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 correct option : **14**

1) Consider the sum of N numbers each represented by n bits. The maximum number of bits to which the sum grows is
   a) (n + N) bits
   b) $(n+\log_2^N)$ bits
   c) $(N+\log_2^n)$ bits
   d) (n * N) bits

2) In impulse invariant transformation, relation between Ω and ω is
   a) $\Omega = \omega T$
   b) $\Omega = \omega/T$
   c) $\omega = \tan(\Omega T)$
   d) $\Omega = (T/2)\tan(\omega T/2)$

3) Which of the following is not true for IIR filters ?
   a) Impulse response duration is infinite
   b) They have poles
   c) They give linear phase response
   d) All above

4) For the Butterworth filter with transfer function $H(s) = \frac{s}{s+9}$. The cutoff frequency Ωc is
   a) 9 b) 3 c) 1 d) None of these

P.T.O.

5) The ideal filters are
   a) Causal b) Non causal
   c) May be causal or non causal d) None of these

6) The approximate width of the main lobe in rectangular window of length M is
   a) $6\pi/M$ b) $8\pi/M$ c) $12\pi/M$ d) $4\pi/M$

7) A Barrel shifter with 16 inputs and left shifts from 0 to 15 requires _____ number of control lines.
   a) 4 b) 15 c) 16 d) None of these

8) A DT signal is
   a) Continuous time continuous amplitude
   b) Continuous time discrete amplitude
   c) Discrete time continuous amplitude
   d) Discreet time discrete amplitude

9) Z-transform reduces to Fourier transform when it is evaluated on
   a) Half circle b) Z circle c) Unit circle d) Imaginary circle

10) The region of convergence of the z-transform of a unit step function is
   a) $|Z| > 1$ b) $|Z| < 1$
   c) (Real part of z) > 0 d) (Real part of z) < 0

11) Number of delay elements are required for direct form I realization of $y(n) = 0.5y(n-1) - 0.25y(n-2) + x(n) + 0.4\,x(n-1)$ are
   a) 1 b) 3 c) 4 d) 2

12) Decimation time FFT decimates
   a) DFT co-efficients b) Input sequence
   c) Both sequence and DFT d) None

13) The value of the twiddle factor W_4^5 is
   a) j b) 1
   c) $-0.707 + j0.707$ d) $-j$

14) The DFT of the signal $x(n) = \{0, 3, 0, -3\}$
   a) $\{0, -2, 0, 2\}$ b) $\{0, -6j, 0, 6j\}$
   c) $\{2, -6j, 0, 6j\}$ d) $\{2, -6j, -2, 6j\}$

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SLR-TJ – 156

Seat No.	

T.E. (Electronics Engg.) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Saturday, 02-12-2017 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 where required.*

SECTION – I

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

a) Explain different application areas of DSP.

b) Compute 4 point DFT of DT signal given below :

$X[n] = \{0, 1, 2, 3\}$

c) Consider the FIR filter with impulse response $h(n) = \{1, -2, 4, 5, 3, 1\}$. Draw the structure for realization.

d) Find system function and impulse response of the system described by $y(n) = 1/5\ y(n-1) + x(n)$.

e) Prove that X(k) is real and even when x(n) is real and even where X(k) is DFT of an N-point sequence x(n).

3. Attempt **any two** : **(2×6=12)**

a) Find the circular convolution of following signals $x[n] = \{1, 3, 5, 3\}$ and $h[n] = \{2, 3, 1, 1\}$.

b) State and prove time reversal and circular time shift property of DFT.

c) Explain basic butterfly structure of DIF FFT algorithm. Given $x(n) = n + 1$ and $N = 4$. Find X(k) using DIF 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 impulse invariant method. Assume T = 1s.

   b) Draw and explain the structure for 4 × 4 Baron Multiplier for unsigned numbers.

   c) Design the first order high pass filter with f_c = 1 kHz and sampling frequency f_s = 10000 sps. Use bilinear transformation method.

   d) Explain in detail Multiply and Accumulate (MAC) unit of digital signal processor.

   e) Explain the frequency sampling method for design of FIR filters.

5. Attempt **any two** : **(2×6=12)**

   a) Explain the Bilinear transformation for digital filters in detail.

   b) Explain the applications of DSP in Image Processing and Biomedical field.

   c) The desired frequency response of a low pass filter is

$$Hd(e^{j\omega}) = \begin{cases} e^{-3j\omega} & -\frac{\pi}{2} \le \omega \le \pi/2 \\ 0 & \frac{\pi}{2} \le |\omega| \le \pi \end{cases}$$

   Determine hd(n). Also determine h(n) using symmetric Hamming window with window length 7.

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SLR-TJ – 156

Seat No.	

Set R

T.E. (Electronics Engg.) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Saturday, 02-12-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
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3) Assume suitable data ***if*** *necessary.*
4) Draw ***neat*** *diagrams where required.*
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 correct option : **14**

1) Decimation time FFT decimates
   a) DFT co-efficients b) Input sequence
   c) Both sequence and DFT d) None

2) The value of the twiddle factor W_4^5 is
   a) j b) 1
   c) $-0.707 + j0.707$ d) $-j$

3) The DFT of the signal x(n) = {0, 3, 0, – 3}
   a) {0, – 2, 0, 2} b) {0, – 6j, 0, 6j}
   c) {2, – 6j, 0, 6j} d) {2, – 6j, – 2, 6j}

4) Consider the sum of N numbers each represented by n bits. The maximum number of bits to which the sum grows is
   a) (n + N) bits b) $(n+\log_2^N)$ bits
   c) $(N+\log_2^n)$ bits d) (n * N) bits

P.T.O.

5) In impulse invariant transformation, relation between Ω and ω is
   a) $\Omega = \omega T$ b) $\Omega = \omega/T$
   c) $\omega = \tan(\Omega T)$ d) $\Omega = (T/2)\tan(\omega T/2)$

6) Which of the following is not true for IIR filters ?
   a) Impulse response duration is infinite
   b) They have poles
   c) They give linear phase response
   d) All above

7) For the Butterworth filter with transfer function $H(s) = \frac{s}{s+9}$. The cutoff frequency Ωc is
   a) 9 b) 3 c) 1 d) None of these

8) The ideal filters are
   a) Causal b) Non causal
   c) May be causal or non causal d) None of these

9) The approximate width of the main lobe in rectangular window of length M is
   a) $6\pi/M$ b) $8\pi/M$ c) $12\pi/M$ d) $4\pi/M$

10) A Barrel shifter with 16 inputs and left shifts from 0 to 15 requires _____ number of control lines.
   a) 4 b) 15 c) 16 d) None of these

11) A DT signal is
   a) Continuous time continuous amplitude
   b) Continuous time discrete amplitude
   c) Discrete time continuous amplitude
   d) Discreet time discrete amplitude

12) Z-transform reduces to Fourier transform when it is evaluated on
   a) Half circle b) Z circle c) Unit circle d) Imaginary circle

13) The region of convergence of the z-transform of a unit step function is
   a) $|Z| > 1$ b) $|Z| < 1$
   c) (Real part of z) > 0 d) (Real part of z) < 0

14) Number of delay elements are required for direct form I realization of $y(n) = 0.5y(n-1) - 0.25y(n-2) + x(n) + 0.4\,x(n-1)$ are
   a) 1 b) 3 c) 4 d) 2

SLR-TJ – 156

Seat No.	

T.E. (Electronics Engg.) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Saturday, 02-12-2017 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 where required.*

SECTION – I

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

a) Explain different application areas of DSP.

b) Compute 4 point DFT of DT signal given below :

X[n] = {0, 1, 2, 3}

c) Consider the FIR filter with impulse response h(n) = {1, – 2, 4, 5, 3, 1}. Draw the structure for realization.

d) Find system function and impulse response of the system described by y(n) = 1/5 y(n – 1) + x(n).

e) Prove that X(k) is real and even when x(n) is real and even where X(k) is DFT of an N-point sequence x(n).

3. Attempt **any two** : **(2×6=12)**

a) Find the circular convolution of following signals x[n] = {1, 3, 5, 3} and h[n] = {2, 3, 1, 1}.

b) State and prove time reversal and circular time shift property of DFT.

c) Explain basic butterfly structure of DIF FFT algorithm. Given x(n) = n + 1 and N = 4. Find X(k) using DIF 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 impulse invariant method. Assume T = 1s.

   b) Draw and explain the structure for 4 × 4 Baron Multiplier for unsigned numbers.

   c) Design the first order high pass filter with f_c = 1 kHz and sampling frequency f_s = 10000 sps. Use bilinear transformation method.

   d) Explain in detail Multiply and Accumulate (MAC) unit of digital signal processor.

   e) Explain the frequency sampling method for design of FIR filters.

5. Attempt **any two** : **(2×6=12)**

   a) Explain the Bilinear transformation for digital filters in detail.

   b) Explain the applications of DSP in Image Processing and Biomedical field.

   c) The desired frequency response of a low pass filter is

$$Hd(e^{j\omega}) = \begin{cases} e^{-3j\omega} & -\frac{\pi}{2} \le \omega \le \pi/2 \\ 0 & \frac{\pi}{2} \le |\omega| \le \pi \end{cases}$$

   Determine hd(n). Also determine h(n) using symmetric Hamming window with window length 7.

SLR-TJ – 156

Seat No.	

Set S

T.E. (Electronics Engg.) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Saturday, 02-12-2017 Max. Marks : 70
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 where required.*
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 correct option : **14**

1) Which of the following is not true for IIR filters ?
   a) Impulse response duration is infinite
   b) They have poles
   c) They give linear phase response
   d) All above

2) For the Butterworth filter with transfer function $H(s) = \frac{s}{s+9}$. The cutoff frequency Ωc is
   a) 9 b) 3 c) 1 d) None of these

3) The ideal filters are
   a) Causal b) Non causal
   c) May be causal or non causal d) None of these

4) The approximate width of the main lobe in rectangular window of length M is
   a) $6\pi/M$ b) $8\pi/M$ c) $12\pi/M$ d) $4\pi/M$

P.T.O.

5) A Barrel shifter with 16 inputs and left shifts from 0 to 15 requires _____ number of control lines.
   a) 4 b) 15 c) 16 d) None of these

6) A DT signal is
   a) Continuous time continuous amplitude
   b) Continuous time discrete amplitude
   c) Discrete time continuous amplitude
   d) Discreet time discrete amplitude

7) Z-transform reduces to Fourier transform when it is evaluated on
   a) Half circle b) Z circle c) Unit circle d) Imaginary circle

8) The region of convergence of the z-transform of a unit step function is
   a) $|Z| > 1$ b) $|Z| < 1$
   c) (Real part of z) > 0 d) (Real part of z) < 0

9) Number of delay elements are required for direct form I realization of $y(n) = 0.5y(n-1) - 0.25y(n-2) + x(n) + 0.4\,x(n-1)$ are
   a) 1 b) 3 c) 4 d) 2

10) Decimation time FFT decimates
   a) DFT co-efficients b) Input sequence
   c) Both sequence and DFT d) None

11) The value of the twiddle factor W_4^5 is
   a) j b) 1
   c) $-0.707 + j0.707$ d) $-j$

12) The DFT of the signal $x(n) = \{0, 3, 0, -3\}$
   a) $\{0, -2, 0, 2\}$ b) $\{0, -6j, 0, 6j\}$
   c) $\{2, -6j, 0, 6j\}$ d) $\{2, -6j, -2, 6j\}$

13) Consider the sum of N numbers each represented by n bits. The maximum number of bits to which the sum grows is
   a) (n + N) bits b) $(n+\log_2^N)$ bits
   c) $(N+\log_2^n)$ bits d) (n * N) bits

14) In impulse invariant transformation, relation between Ω and ω is
   a) $\Omega = \omega T$ b) $\Omega = \omega/T$
   c) $\omega = \tan(\Omega T)$ d) $\Omega = (T/2)\tan(\omega T/2)$

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SLR-TJ – 156

Seat No.	

T.E. (Electronics Engg.) (Part – I) (CGPA) Examination, 2017
DIGITAL SIGNAL PROCESSING

Day and Date : Saturday, 02-12-2017 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 where required.*

SECTION – I

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

a) Explain different application areas of DSP.

b) Compute 4 point DFT of DT signal given below :

$X[n] = \{0, 1, 2, 3\}$

c) Consider the FIR filter with impulse response $h(n) = \{1, -2, 4, 5, 3, 1\}$. Draw the structure for realization.

d) Find system function and impulse response of the system described by $y(n) = 1/5\ y(n-1) + x(n)$.

e) Prove that X(k) is real and even when x(n) is real and even where X(k) is DFT of an N-point sequence x(n).

3. Attempt **any two** : **(2×6=12)**

a) Find the circular convolution of following signals $x[n] = \{1, 3, 5, 3\}$ and $h[n] = \{2, 3, 1, 1\}$.

b) State and prove time reversal and circular time shift property of DFT.

c) Explain basic butterfly structure of DIF FFT algorithm. Given $x(n) = n + 1$ and $N = 4$. Find X(k) using DIF 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 impulse invariant method. Assume T = 1s.

   b) Draw and explain the structure for 4 × 4 Baron Multiplier for unsigned numbers.

   c) Design the first order high pass filter with f_c = 1 kHz and sampling frequency f_s = 10000 sps. Use bilinear transformation method.

   d) Explain in detail Multiply and Accumulate (MAC) unit of digital signal processor.

   e) Explain the frequency sampling method for design of FIR filters.

5. Attempt **any two** : **(2×6=12)**

   a) Explain the Bilinear transformation for digital filters in detail.

   b) Explain the applications of DSP in Image Processing and Biomedical field.

   c) The desired frequency response of a low pass filter is

$$Hd(e^{j\omega}) = \begin{cases} e^{-3j\omega} & -\frac{\pi}{2} \le \omega \le \pi/2 \\ 0 & \frac{\pi}{2} \le |\omega| \le \pi \end{cases}$$

   Determine hd(n). Also determine h(n) using symmetric Hamming window with window length 7.

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SLR-TJ – 157

Seat No.	

Set P

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

Day and Date : Tuesday, 5-12-2017 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 on Page No. **3**. **Each** quetsion carries **one** mark.*
*2) **Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***
*3) Figures to the **right** indicate **full** marks.*
*4) Assume suitable data **wherever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Objective questions : **(14×1=14)**

1) In the TRAP, RST 7.5, RST 6.5, RST 5.5, which is having low priority
   a) TRAP b) RST 7.5 c) RST 6.5 d) RST 5.5

2) Number of Address lines required to access 64KB of memory are
   a) 10 b) 16 c) 12 d) 13

3) The instruction "STA 9000" requires _____ T-states.
   a) 13 b) 7 c) 10 d) 18

4) Vector location of RST 7.5 interrupt is
   a) 0024H b) 002CH c) 0034H d) 003CH

5) The unit that supervises each instruction in the microprocessor 8085 is
   a) ALU b) Control Unit
   c) Accumulator d) Instruction decoder

6) In the following interrupts which is/are the vectored interrupt/s
   a) TRAP b) RST 7.5 c) RST 6.5 d) All of the above

7) The memory map of a 4KB memory begins at the location 4000 H. What is the last location on the chip ?
   a) 43FFH b) 4FFFH c) 47FFH d) 7FFFH

P.T.O.

8) For bidirectional data transfer, 8255 can be used in
   a) Mode 0 b) Mode 1 c) Mode 2 d) BSR mode

9) _____ can be used as an input 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 SIM ?
   a) Select interrupt mask b) Sorting interrupt mask
   c) Set interrupt mask d) Set input mask

12) Control register and status register of 8251 are having the same address.
   a) True b) False

13) If A1 = 0, A0 = 1 then the input read cycle is performed from
   a) port A to data bus b) port B to data bus
   c) port C to data bus d) CWR to data bus

14) The time taken by the ADC from the active edge of SOC (start of conversion) pulse till the active edge of EOC (end of conversion) signal is called
   a) Edge time b) Settling time
   c) Conversion delay d) Time delay

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SLR-TJ – 157

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

Day and Date : Tuesday, 5-12-2017 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) What I the need of de-multiplex AD0-AD7 lines ? How to de-multiplex AD0-AD7 lines ?

b) Write a program to count the number of 1's in a 8-bit binary number.

c) Write an assembly program to split hex data into two nibbles and store it in memory.

d) Explain the function of READY, HOLD, HLDA, ALE and X1 and X2 pins of 8085.

e) What is subroutine ? Explain CALL and RET instructions.

3. Answer **any two** : **(2×6=12)**

a) What is interrupt ? Explain interrupt structure in 8085.

b) Design a 8085 microprocessor based system with 8 KB EPROM having a word length of 8-bits with the starting address of 0000H and 2KB RAMs having word lengths of 8-bits with starting address of 4000H.

c) Write the program to convert a two digit hex number into its equivalent BCD number.

SECTION – II

4. Answer **any four** : **(4×4=16)**

   a) Compare I/O mapped I/O and memory mapped I/O interfacing.

   b) How the I/O device is communicating with the 8255 in mode1 of PPI 8255 ?

   c) Draw timing diagram for the instruction : 1234 : IN 20h.

   d) Draw the functional block diagram of 8253 and explain it.

   e) Draw and explain dual slope ADC.

5. Answer **any two** : **(2×6=12)**

   a) Interface ADC 0808 to 8085 and write a program for analog to digital conversion.

   b) Interface timer 8251 to the 8085 from address 40h. Write a program to receive 10 bytes serially. Assume baud rate 16x, 8 bits/character, 1 stop bit.

   c) Interface 3 × 8 keypad to the 8085, and write a program to detect the key pressed.

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SLR-TJ – 157

Seat No.	

Set Q

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

Day and Date : Tuesday, 5-12-2017 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 on Page No. **3**. **Each** quetsion carries **one** mark.*
*2) **Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***
*3) Figures to the **right** indicate **full** marks.*
*4) Assume suitable data **wherever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Objective questions : **(14×1=14)**

1) For bidirectional data transfer, 8255 can be used in
   a) Mode 0 b) Mode 1 c) Mode 2 d) BSR mode

2) _____ can be used as an input 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 SIM ?
   a) Select interrupt mask b) Sorting interrupt mask
   c) Set interrupt mask d) Set input mask

5) Control register and status register of 8251 are having the same address.
   a) True b) False

6) If A1 = 0, A0 = 1 then the input read cycle is performed from
   a) port A to data bus b) port B to data bus
   c) port C to data bus d) CWR to data bus

7) The time taken by the ADC from the active edge of SOC (start of conversion) pulse till the active edge of EOC (end of conversion) signal is called
   a) Edge time b) Settling time
   c) Conversion delay d) Time delay

8) In the TRAP, RST 7.5, RST 6.5, RST 5.5, which is having low priority
   a) TRAP b) RST 7.5 c) RST 6.5 d) RST 5.5

9) Number of Address lines required to access 64KB of memory are
   a) 10 b) 16 c) 12 d) 13

10) The instruction “STA 9000” requires _____ T-states.
   a) 13 b) 7 c) 10 d) 18

11) Vector location of RST 7.5 interrupt is
   a) 0024H b) 002CH c) 0034H d) 003CH

12) The unit that supervises each instruction in the microprocessor 8085 is
   a) ALU b) Control Unit
   c) Accumulator d) Instruction decoder

13) In the following interrupts which is/are the vectored interrupt/s
   a) TRAP b) RST 7.5 c) RST 6.5 d) All of the above

14) The memory map of a 4KB memory begins at the location 4000 H. What is the last location on the chip ?
   a) 43FFH b) 4FFFH c) 47FFH d) 7FFFH

_____

SLR-TJ – 157

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

Day and Date : Tuesday, 5-12-2017 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) What I the need of de-multiplex AD0-AD7 lines ? How to de-multiplex AD0-AD7 lines ?

b) Write a program to count the number of 1's in a 8-bit binary number.

c) Write an assembly program to split hex data into two nibbles and store it in memory.

d) Explain the function of READY, HOLD, HLDA, ALE and X1 and X2 pins of 8085.

e) What is subroutine ? Explain CALL and RET instructions.

3. Answer **any two** : **(2×6=12)**

a) What is interrupt ? Explain interrupt structure in 8085.

b) Design a 8085 microprocessor based system with 8 KB EPROM having a word length of 8-bits with the starting address of 0000H and 2KB RAMs having word lengths of 8-bits with starting address of 4000H.

c) Write the program to convert a two digit hex number into its equivalent BCD number.

SECTION – II

4. Answer **any four** : **(4×4=16)**

   a) Compare I/O mapped I/O and memory mapped I/O interfacing.

   b) How the I/O device is communicating with the 8255 in mode1 of PPI 8255 ?

   c) Draw timing diagram for the instruction : 1234 : IN 20h.

   d) Draw the functional block diagram of 8253 and explain it.

   e) Draw and explain dual slope ADC.

5. Answer **any two** : **(2×6=12)**

   a) Interface ADC 0808 to 8085 and write a program for analog to digital conversion.

   b) Interface timer 8251 to the 8085 from address 40h. Write a program to receive 10 bytes serially. Assume baud rate 16x, 8 bits/character, 1 stop bit.

   c) Interface 3 × 8 keypad to the 8085, and write a program to detect the key pressed.

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SLR-TJ – 157

Seat No.	

Set R

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

Day and Date : Tuesday, 5-12-2017 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 on Page No. **3**. **Each** quetsion carries **one** mark.*
*2) **Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***
*3) Figures to the **right** indicate **full** marks.*
*4) Assume suitable data **wherever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Objective questions : **(14×1=14)**

1) The unit that supervises each instruction in the microprocessor 8085 is
   a) ALU b) Control Unit
   c) Accumulator d) Instruction decoder

2) In the following interrupts which is/are the vectored interrupt/s
   a) TRAP b) RST 7.5 c) RST 6.5 d) All of the above

3) The memory map of a 4KB memory begins at the location 4000 H. What is the last location on the chip ?
   a) 43FFH b) 4FFFH c) 47FFH d) 7FFFH

4) For bidirectional data transfer, 8255 can be used in
   a) Mode 0 b) Mode 1 c) Mode 2 d) BSR mode

5) _____ can be used as an input 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 SIM ?
   a) Select interrupt mask
   b) Sorting interrupt mask
   c) Set interrupt mask
   d) Set input mask

8) Control register and status register of 8251 are having the same address.
   a) True
   b) False

9) If A1 = 0, A0 = 1 then the input read cycle is performed from
   a) port A to data bus
   b) port B to data bus
   c) port C to data bus
   d) CWR to data bus

10) The time taken by the ADC from the active edge of SOC (start of conversion) pulse till the active edge of EOC (end of conversion) signal is called
   a) Edge time
   b) Settling time
   c) Conversion delay
   d) Time delay

11) In the TRAP, RST 7.5, RST 6.5, RST 5.5, which is having low priority
   a) TRAP b) RST 7.5 c) RST 6.5 d) RST 5.5

12) Number of Address lines required to access 64KB of memory are
   a) 10 b) 16 c) 12 d) 13

13) The instruction “STA 9000” requires _____ T-states.
   a) 13 b) 7 c) 10 d) 18

14) Vector location of RST 7.5 interrupt is
   a) 0024H b) 002CH c) 0034H d) 003CH

_____

SLR-TJ – 157

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

Day and Date : Tuesday, 5-12-2017 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) What I the need of de-multiplex AD0-AD7 lines ? How to de-multiplex AD0-AD7 lines ?

b) Write a program to count the number of 1's in a 8-bit binary number.

c) Write an assembly program to split hex data into two nibbles and store it in memory.

d) Explain the function of READY, HOLD, HLDA, ALE and X1 and X2 pins of 8085.

e) What is subroutine ? Explain CALL and RET instructions.

3. Answer **any two** : **(2×6=12)**

a) What is interrupt ? Explain interrupt structure in 8085.

b) Design a 8085 microprocessor based system with 8 KB EPROM having a word length of 8-bits with the starting address of 0000H and 2KB RAMs having word lengths of 8-bits with starting address of 4000H.

c) Write the program to convert a two digit hex number into its equivalent BCD number.

SECTION – II

4. Answer **any four** : **(4×4=16)**

   a) Compare I/O mapped I/O and memory mapped I/O interfacing.

   b) How the I/O device is communicating with the 8255 in mode1 of PPI 8255 ?

   c) Draw timing diagram for the instruction : 1234 : IN 20h.

   d) Draw the functional block diagram of 8253 and explain it.

   e) Draw and explain dual slope ADC.

5. Answer **any two** : **(2×6=12)**

   a) Interface ADC 0808 to 8085 and write a program for analog to digital conversion.

   b) Interface timer 8251 to the 8085 from address 40h. Write a program to receive 10 bytes serially. Assume baud rate 16x, 8 bits/character, 1 stop bit.

   c) Interface 3 × 8 keypad to the 8085, and write a program to detect the key pressed.

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SLR-TJ – 157

Seat No.	

Set S

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

Day and Date : Tuesday, 5-12-2017 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 on Page No. **3**. **Each** quetsion carries **one** mark.*
*2) **Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.***
*3) Figures to the **right** indicate **full** marks.*
*4) Assume suitable data **wherever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Objective questions : **(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 SIM ?
   a) Select interrupt mask b) Sorting interrupt mask
   c) Set interrupt mask d) Set input mask

3) Control register and status register of 8251 are having the same address.
   a) True b) False

4) If A1 = 0, A0 = 1 then the input read cycle is performed from
   a) port A to data bus b) port B to data bus
   c) port C to data bus d) CWR to data bus

5) The time taken by the ADC from the active edge of SOC (start of conversion) pulse till the active edge of EOC (end of conversion) signal is called
   a) Edge time b) Settling time
   c) Conversion delay d) Time delay

6) In the TRAP, RST 7.5, RST 6.5, RST 5.5, which is having low priority
   a) TRAP b) RST 7.5 c) RST 6.5 d) RST 5.5

P.T.O.

7) Number of Address lines required to access 64KB of memory are
   a) 10 b) 16 c) 12 d) 13

8) The instruction “STA 9000” requires _____ T-states.
   a) 13 b) 7 c) 10 d) 18

9) Vector location of RST 7.5 interrupt is
   a) 0024H b) 002CH c) 0034H d) 003CH

10) The unit that supervises each instruction in the microprocessor 8085 is
   a) ALU b) Control Unit
   c) Accumulator d) Instruction decoder

11) In the following interrupts which is/are the vectored interrupt/s
   a) TRAP b) RST 7.5 c) RST 6.5 d) All of the above

12) The memory map of a 4KB memory begins at the location 4000 H. What is the last location on the chip ?
   a) 43FFH b) 4FFFH c) 47FFH d) 7FFFH

13) For bidirectional data transfer, 8255 can be used in
   a) Mode 0 b) Mode 1 c) Mode 2 d) BSR mode

14) _____ can be used as an input port.
   a) Buffer b) Latch c) Decoder d) Encoder

_____

SLR-TJ – 157

Seat No.	

T.E. (Electronics) (Part – I) (CGPA) Examination, 2017
MICROPROCESSORS AND INTERFACING

Day and Date : Tuesday, 5-12-2017 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) What I the need of de-multiplex AD0-AD7 lines ? How to de-multiplex AD0-AD7 lines ?

b) Write a program to count the number of 1's in a 8-bit binary number.

c) Write an assembly program to split hex data into two nibbles and store it in memory.

d) Explain the function of READY, HOLD, HLDA, ALE and X1 and X2 pins of 8085.

e) What is subroutine ? Explain CALL and RET instructions.

3. Answer **any two** : **(2×6=12)**

a) What is interrupt ? Explain interrupt structure in 8085.

b) Design a 8085 microprocessor based system with 8 KB EPROM having a word length of 8-bits with the starting address of 0000H and 2KB RAMs having word lengths of 8-bits with starting address of 4000H.

c) Write the program to convert a two digit hex number into its equivalent BCD number.

SECTION – II

4. Answer **any four** : **(4×4=16)**

   a) Compare I/O mapped I/O and memory mapped I/O interfacing.

   b) How the I/O device is communicating with the 8255 in mode1 of PPI 8255 ?

   c) Draw timing diagram for the instruction : 1234 : IN 20h.

   d) Draw the functional block diagram of 8253 and explain it.

   e) Draw and explain dual slope ADC.

5. Answer **any two** : **(2×6=12)**

   a) Interface ADC 0808 to 8085 and write a program for analog to digital conversion.

   b) Interface timer 8251 to the 8085 from address 40h. Write a program to receive 10 bytes serially. Assume baud rate 16x, 8 bits/character, 1 stop bit.

   c) Interface 3 × 8 keypad to the 8085, and write a program to detect the key pressed.

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SLR-TJ – 158

Seat No.	

Set P

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

Day and Date : Thursday, 7-12-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The operator 'del' (∇) is a
   a) vector space function b) vector time function
   c) scalar space function d) scalar time function

2) The normal component of electric flux density across a dielectric-dielectric boundary
   a) are discontinuous
   b) are continuous
   c) depend on the magnitude of the surface charge density
   d) depend on electric field intensity

3) Cylindrical coordinate 'r' is related to the Cartesian coordinate as
   a) (x, y) b) (x + y) c) (x^2/y^2) d) $(x^2 + y^2)^{1/2}$

4) For transformation from the Cartesian coordinate system of Spherical coordinate system, should be equal to
   a) $\cos\theta$ b) $-\cos\theta$ c) $\sin\theta$ d) $-\sin\theta$

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

P.T.O.

6) Stoke's theorem relates, _____ integral to a _____ integral.
   a) volume, surface b) volume, line
   c) line, surface d) all of these

7) An electric charge of Q coulombs is located at the origin. Consider electric potential V and electric field intensity E at any point (x, y, z). Then
   a) E and V are both scalars
   b) E and V are both vectors
   c) E is a scalar and V is a Vector
   d) E is a Vector and V is a scalar

8) 25. A dipole produces an electric field intensity of 1 m V/m at a distance of 2 km. The field intensity at a distance of 4 km will be
   a) 1 m V/m b) 0.75 m V/m c) 0.50 m V/m d) 0.25 m V/m

9) Wave number has units of
   a) Radians b) Meter c) Radians/meter d) None of these

10) Phase velocity is given as
   a) $\omega\beta$ b) $\beta\omega$ c) β/ω d) None of these

11) A transmission line is specified in terms of
   a) R, G, L b) G, L, C c) R, G, L, C d) None of these

12) Voltage reflection coefficient is the ratio of _____ wave to _____ wave.
   a) Incident, reflected b) Reflected, incident
   c) Incident, absorbed d) Absorbed, incident

13) The α is known as
   a) Amplitude constant b) Attenuation constant
   c) Absolute constant d) None

14) If antenna directivity and antenna gain are equal, then antenna efficiency is _____ %.
   a) 20 b) 50 c) 75 d) 100

_____

SLR-TJ – 158

Seat No.	

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

Day and Date : Thursday, 7-12-2017 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. Answer **any four** questions : **(4×4=16)**

a) State and explain Coulomb's Law.

b) Uniform charge distribution $\rho_1 = 20$ n c/m is distributed along x = 2m, y = – 4m. Find E at (– 2, 1, 4).

c) Prove that $E = -\nabla V$.

d) Find the area of circular disc with radius 2m and circumference of circle with radius 3m.

e) Convert point A (3, 4, 5) in cylindrical and spherical form.

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

a) State and derive point form of Gauss's law and state Divergence theorem.

b) Derive the expression for H due to finite length filament placed along z-axis from $z = z_1$ to z_2.

c) Given $\ddot{E} = -8xy\ddot{a}_x - 4x^2\ddot{a}_y + \ddot{a}_z v/m$ find work done in moving 6 C charge from point A (1, 8, 5) to B (2, 18, 6) along path y = 3x + 2 and z = x + 4.

SECTION – II

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

   a) Write a note on skin depth.

   b) Show that $Z_0 = \sqrt{ZscZoc}$.

   c) A signal of 10 V is applied to a 50Ω coaxial transmission line terminated in load 200Ω. Find ρv and reflected voltage.

   d) Define Directive Gain and Directivity of antenna.

   e) Explain Antenna Efficiency and give its significance.

5. Answer **any two** questions : **(6×2=12)**

   a) Derive the expression for radiation resistance of short dipole antenna.

   b) A uniform transmission line has the constants R = 2Ω/m, L = 8n H/m, C = 0.23 pF/m and G = 0.5 m Mho/m. At 1GHz determine :

      i) Z_0

      ii) Propagation constant.

   c) State and derive Poynting Theorem.

SLR-TJ – 158

Seat No.	

Set Q

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

Day and Date : Thursday, 7-12-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) 25. A dipole produces an electric field intensity of 1 m V/m at a distance of 2 km. The field intensity at a distance of 4 km will be
a) 1 m V/m b) 0.75 m V/m c) 0.50 m V/m d) 0.25 m V/m

2) Wave number has units of
a) Radians b) Meter
c) Radians/meter d) None of these

3) Phase velocity is given as
a) $\omega\beta$ b) $\beta\omega$ c) β/ω d) None of these

4) A transmission line is specified in terms of
a) R, G, L b) G, L, C c) R, G, L, C d) None of these

5) Voltage reflection coefficient is the ratio of _____ wave to _____ wave.
a) Incident, reflected b) Reflected, incident
c) Incident, absorbed d) Absorbed, incident

6) The α is known as
a) Amplitude constant b) Attenuation constant
c) Absolute constant d) None

P.T.O.

7) If antenna directivity and antenna gain are equal, then antenna efficiency is _____ %.
   a) 20 b) 50 c) 75 d) 100

8) The operator 'del' (∇) is a
   a) vector space function b) vector time function
   c) scalar space function d) scalar time function

9) The normal component of electric flux density across a dielectric-dielectric boundary
   a) are discontinuous
   b) are continuous
   c) depend on the magnitude of the surface charge density
   d) depend on electric field intensity

10) Cylindrical coordinate 'r' is related to the Cartesian coordinate as
   a) (x, y) b) (x + y) c) (x^2/y^2) d) $(x^2 + y^2)^{1/2}$

11) For transformation from the Cartesian coordinate system of Spherical coordinate system, should be equal to
   a) $\cos\theta$ b) $-\cos\theta$ c) $\sin\theta$ d) $-\sin\theta$

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

13) Stoke's theorem relates, _____ integral to a _____ integral.
   a) volume, surface b) volume, line
   c) line, surface d) all of these

14) An electric charge of Q coulombs is located at the origin. Consider electric potential V and electric field intensity E at any point (x, y, z). Then
   a) E and V are both scalars
   b) E and V are both vectors
   c) E is a scalar and V is a Vector
   d) E is a Vector and V is a scalar

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SLR-TJ – 158

Seat No.	

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

Day and Date : Thursday, 7-12-2017 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. Answer **any four** questions : **(4×4=16)**

a) State and explain Coulomb's Law.

b) Uniform charge distribution $\rho_1 = 20$ n c/m is distributed along x = 2m, y = – 4m. Find E at (– 2, 1, 4).

c) Prove that $E = -\nabla V$.

d) Find the area of circular disc with radius 2m and circumference of circle with radius 3m.

e) Convert point A (3, 4, 5) in cylindrical and spherical form.

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

a) State and derive point form of Gauss's law and state Divergence theorem.

b) Derive the expression for H due to finite length filament placed along z-axis from $z = z_1$ to z_2.

c) Given $\ddot{E} = -8xy\ddot{a}_x - 4x^2\ddot{a}_y + \ddot{a}_z v/m$ find work done in moving 6 C charge from point A (1, 8, 5) to B (2, 18, 6) along path y = 3x + 2 and z = x + 4.

SECTION – II

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

   a) Write a note on skin depth.

   b) Show that $Z_0 = \sqrt{ZscZoc}$.

   c) A signal of 10 V is applied to a 50Ω coaxial transmission line terminated in load 200Ω. Find ρv and reflected voltage.

   d) Define Directive Gain and Directivity of antenna.

   e) Explain Antenna Efficiency and give its significance.

5. Answer **any two** questions : **(6×2=12)**

   a) Derive the expression for radiation resistance of short dipole antenna.

   b) A uniform transmission line has the constants R = 2Ω/m, L = 8n H/m, C = 0.23 pF/m and G = 0.5 m Mho/m. At 1GHz determine :

      i) Z_0

      ii) Propagation constant.

   c) State and derive Poynting Theorem.

SLR-TJ – 158

Seat No.	

Set R

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

Day and Date : Thursday, 7-12-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

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

2) Stoke's theorem relates, _____ integral to a _____ integral.
   a) volume, surface b) volume, line
   c) line, surface d) all of these

3) An electric charge of Q coulombs is located at the origin. Consider electric potential V and electric field intensity E at any point (x, y, z). Then
   a) E and V are both scalars
   b) E and V are both vectors
   c) E is a scalar and V is a Vector
   d) E is a Vector and V is a scalar

4) 25. A dipole produces an electric field intensity of 1 m V/m at a distance of 2 km. The field intensity at a distance of 4 km will be
   a) 1 m V/m b) 0.75 m V/m c) 0.50 m V/m d) 0.25 m V/m

5) Wave number has units of
   a) Radians b) Meter
   c) Radians/meter d) None of these

P.T.O.

6) Phase velocity is given as
   a) $\omega\beta$ b) $\beta\omega$ c) β / ω d) None of these

7) A transmission line is specified in terms of
   a) R, G, L b) G, L, C c) R, G, L, C d) None of these

8) Voltage reflection coefficient is the ratio of _____ wave to _____ wave.
   a) Incident, reflected b) Reflected, incident
   c) Incident, absorbed d) Absorbed, incident

9) The α is known as
   a) Amplitude constant b) Attenuation constant
   c) Absolute constant d) None

10) If antenna directivity and antenna gain are equal, then antenna efficiency is _____ %.
   a) 20 b) 50 c) 75 d) 100

11) The operator 'del' (∇) is a
   a) vector space function b) vector time function
   c) scalar space function d) scalar time function

12) The normal component of electric flux density across a dielectric-dielectric boundary
   a) are discontinuous
   b) are continuous
   c) depend on the magnitude of the surface charge density
   d) depend on electric field intensity

13) Cylindrical coordinate 'r' is related to the Cartesian coordinate as
   a) (x, y) b) (x + y) c) (x^2 / y^2) d) $(x^2 + y^2)^{1/2}$

14) For transformation from the Cartesian coordinate system of Spherical coordinate system, should be equal to
   a) cos θ b) – cos θ c) sin θ d) – sin θ

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SLR-TJ – 158

Seat No.	

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

Day and Date : Thursday, 7-12-2017 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. Answer **any four** questions : **(4×4=16)**

a) State and explain Coulomb's Law.

b) Uniform charge distribution $\rho_1 = 20$ n c/m is distributed along x = 2m, y = – 4m. Find E at (– 2, 1, 4).

c) Prove that $E = -\nabla V$.

d) Find the area of circular disc with radius 2m and circumference of circle with radius 3m.

e) Convert point A (3, 4, 5) in cylindrical and spherical form.

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

a) State and derive point form of Gauss's law and state Divergence theorem.

b) Derive the expression for H due to finite length filament placed along z-axis from $z = z_1$ to z_2.

c) Given $\ddot{E} = -8xy\ddot{a}_x - 4x^2\ddot{a}_y + \ddot{a}_z v/m$ find work done in moving 6 C charge from point A (1, 8, 5) to B (2, 18, 6) along path y = 3x + 2 and z = x + 4.

SECTION – II

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

   a) Write a note on skin depth.

   b) Show that $Z_0 = \sqrt{ZscZoc}$.

   c) A signal of 10 V is applied to a 50Ω coaxial transmission line terminated in load 200Ω. Find ρv and reflected voltage.

   d) Define Directive Gain and Directivity of antenna.

   e) Explain Antenna Efficiency and give its significance.

5. Answer **any two** questions : **(6×2=12)**

   a) Derive the expression for radiation resistance of short dipole antenna.

   b) A uniform transmission line has the constants R = 2Ω/m, L = 8n H/m, C = 0.23 pF/m and G = 0.5 m Mho/m. At 1GHz determine :

      i) Z_0

      ii) Propagation constant.

   c) State and derive Poynting Theorem.

SLR-TJ – 158

Seat No.	

Set S

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

Day and Date : Thursday, 7-12-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Phase velocity is given as
a) $\omega\beta$ b) $\beta\omega$ c) β/ω d) None of these

2) A transmission line is specified in terms of
a) R, G, L b) G, L, C c) R, G, L, C d) None of these

3) Voltage reflection coefficient is the ratio of _____ wave to _____ wave.
a) Incident, reflected b) Reflected, incident
c) Incident, absorbed d) Absorbed, incident

4) The α is known as
a) Amplitude constant b) Attenuation constant
c) Absolute constant d) None

5) If antenna directivity and antenna gain are equal, then antenna efficiency is _____ %.
a) 20 b) 50 c) 75 d) 100

6) The operator 'del' (∇) is a
a) vector space function b) vector time function
c) scalar space function d) scalar time function

P.T.O.

7) The normal component of electric flux density across a dielectric-dielectric boundary
   a) are discontinuous
   b) are continuous
   c) depend on the magnitude of the surface charge density
   d) depend on electric field intensity

8) Cylindrical coordinate 'r' is related to the Cartesian coordinate as
   a) (x, y) b) (x + y) c) (x^2/y^2) d) $(x^2 + y^2)^{½}$

9) For transformation from the Cartesian coordinate system of Spherical coordinate system, should be equal to
   a) cos θ b) – cos θ c) sin θ d) – sin θ

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

11) Stoke's theorem relates, _____ integral to a _____ integral.
   a) volume, surface b) volume, line
   c) line, surface d) all of these

12) An electric charge of Q coulombs is located at the origin. Consider electric potential V and electric field intensity E at any point (x, y, z). Then
   a) E and V are both scalars
   b) E and V are both vectors
   c) E is a scalar and V is a Vector
   d) E is a Vector and V is a scalar

13) 25. A dipole produces an electric field intensity of 1 m V/m at a distance of 2 km. The field intensity at a distance of 4 km will be
   a) 1 m V/m b) 0.75 m V/m c) 0.50 m V/m d) 0.25 m V/m

14) Wave number has units of
   a) Radians b) Meter c) Radians/meter d) None of these

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SLR-TJ – 158

Seat No.	

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
ELECTROMAGNETIC ENGINEERING

Day and Date : Thursday, 7-12-2017 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. Answer **any four** questions : **(4×4=16)**

a) State and explain Coulomb's Law.

b) Uniform charge distribution $\rho_1 = 20$ n c/m is distributed along x = 2m, y = – 4m. Find E at (– 2, 1, 4).

c) Prove that $E = -\nabla V$.

d) Find the area of circular disc with radius 2m and circumference of circle with radius 3m.

e) Convert point A (3, 4, 5) in cylindrical and spherical form.

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

a) State and derive point form of Gauss's law and state Divergence theorem.

b) Derive the expression for H due to finite length filament placed along z-axis from $z = z_1$ to z_2.

c) Given $\ddot{E} = -8xy\ddot{a}_x - 4x^2\ddot{a}_y + \ddot{a}_z v/m$ find work done in moving 6 C charge from point A (1, 8, 5) to B (2, 18, 6) along path y = 3x + 2 and z = x + 4.

SECTION – II

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

   a) Write a note on skin depth.

   b) Show that $Z_0 = \sqrt{ZscZoc}$.

   c) A signal of 10 V is applied to a 50Ω coaxial transmission line terminated in load 200Ω. Find ρv and reflected voltage.

   d) Define Directive Gain and Directivity of antenna.

   e) Explain Antenna Efficiency and give its significance.

5. Answer **any two** questions : **(6×2=12)**

   a) Derive the expression for radiation resistance of short dipole antenna.

   b) A uniform transmission line has the constants R = 2Ω/m, L = 8n H/m, C = 0.23 pF/m and G = 0.5 m Mho/m. At 1GHz determine :

      i) Z_0

      ii) Propagation constant.

   c) State and derive Poynting Theorem.

SLR-TJ – 159

Seat No.	

Set **P**

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Saturday, 9-12-2017 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 option : **(1×14=14)**

1) Take odd man out-MS Project, MS Access, DB2, Oracle
   a) MS Project b) MS Access c) DB2 d) Oracle

2) 'E' in ECM is an abbreviation for
   a) Electronic b) Enterprise c) Early d) Entire

3) Take an odd man out-NEFT, IRCTC, RTGS, PayTM
   a) NEFT b) IRCTC c) RTGS d) PayTM

4) Two types of data base queries are
   a) select and inform b) select and action
   c) action and shared d) inform and shared

5) Which of below is not a deliverable for a typical software development project ?
   a) Code b) Milestone
   c) Design document d) Testing report

6) The processes required to ensure that the project includes all the work required is called project _____ management.
   a) Scope b) Integration c) Procurement d) Resource

P.T.O.

7) Take odd man out-functional requirements, quality requirements, resource requirements, risk requirements.
   a) Functional requirements b) Quality requirements
   c) Resource requirements d) Risk requirements

8) An IT project can produce
   a) System b) Software
   c) Recommendations d) All of these

9) ISO/IEC _____ establishes a common framework for software life cycle processes.
   a) 2008 b) 12008
   c) 12207 d) 12208

10) An organization is a _____ and _____structure.
   a) Formal, temporary b) Informal, stable
   c) Formal, stable d) All of these

11) Which of below example shows mutual influence of organization and information system on each other ?
   a) Axis Bank b) Amazon
   c) IRCTC d) All of these

12) Take odd man out-tuple, relation, attribute, query
   a) Tuple b) Relation
   c) Attribute d) Query

13) Which of below is a model of B2B e commerce transaction ?
   a) Storefront b) Cyber mall
   c) Buy side Marketplace d) All of these

14) Union Bank Digi Purse is an example of
   a) e wallet b) Credit card
   c) NEFT d) RTGS

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SLR-TJ – 159

Seat No.	

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Saturday, 9-12-2017 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** : **(2×6=12)**
   a) Discuss cloud computing and its types.
   b) With suitable example discuss concept of data warehouse and data mart.
   c) Discuss benefits of E Commerce to organizations.

3. Solve **any four** : **(4×4=16)**
   a) With suitable example explain ethical issue of privacy related to IS.
   b) With suitable example scenario explain one application of electronic content management.
   c) With suitable example discuss how IT supports people in an enterprise.
   d) What is E Commerce ? What is its extent ?
   e) With suitable example explain changing work practices.

SECTION – II

4. Solve **any two** : **(2×6=12)**
   a) Discuss the rules for constructing precedence networks.
   b) With suitable example explain organization, its features and practices.
   c) Discuss ISO 12207 Software Development Life Cycle.

5. Solve **any four** : **(4×4=16)**
   a) Discuss various business pressures and how organizations responds to it.
   b) What is project management body of knowledge ?
   c) With suitable example explain how a software project differs than other engineering projects.
   d) What is change control ? What is its procedure ?
   e) Discuss Rapid Application Development (RAD) Model.

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Set P

Set P

SLR-TJ – 159

Seat No.	

Set **Q**

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Saturday, 9-12-2017 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 option : **(1×14=14)**

1) An IT project can produce
   a) System b) Software
   c) Recommendations d) All of these

2) ISO/IEC _____ establishes a common framework for software life cycle processes.
   a) 2008 b) 12008
   c) 12207 d) 12208

3) An organization is a _____ and _____structure.
   a) Formal, temporary b) Informal, stable
   c) Formal, stable d) All of these

4) Which of below example shows mutual influence of organization and information system on each other ?
   a) Axis Bank b) Amazon
   c) IRCTC d) All of these

P.T.O.

5) Take odd man out-tuple, relation, attribute, query
   a) Tuple b) Relation
   c) Attribute d) Query

6) Which of below is a model of B2B e commerce transaction ?
   a) Storefront b) Cyber mall
   c) Buy side Marketplace d) All of these

7) Union Bank Digi Purse is an example of
   a) e wallet b) Credit card
   c) NEFT d) RTGS

8) Take odd man out-MS Project, MS Access, DB2, Oracle
   a) MS Project b) MS Access c) DB2 d) Oracle

9) 'E' in ECM is an abbreviation for
   a) Electronic b) Enterprise c) Early d) Entire

10) Take an odd man out-NEFT, IRCTC, RTGS, PayTM
   a) NEFT b) IRCTC c) RTGS d) PayTM

11) Two types of data base queries are
   a) select and inform b) select and action
   c) action and shared d) inform and shared

12) Which of below is not a deliverable for a typical software development project ?
   a) Code b) Milestone
   c) Design document d) Testing report

13) The processes required to ensure that the project includes all the work required is called project _____ management.
   a) Scope b) Integration c) Procurement d) Resource

14) Take odd man out-functional requirements, quality requirements, resource requirements, risk requirements.
   a) Functional requirements b) Quality requirements
   c) Resource requirements d) Risk requirements

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SLR-TJ – 159

Seat No.	

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Saturday, 9-12-2017 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.*
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SECTION – I

2. Solve **any two** : **(2×6=12)**
   a) Discuss cloud computing and its types.
   b) With suitable example discuss concept of data warehouse and data mart.
   c) Discuss benefits of E Commerce to organizations.

3. Solve **any four** : **(4×4=16)**
   a) With suitable example explain ethical issue of privacy related to IS.
   b) With suitable example scenario explain one application of electronic content management.
   c) With suitable example discuss how IT supports people in an enterprise.
   d) What is E Commerce ? What is its extent ?
   e) With suitable example explain changing work practices.

SECTION – II

4. Solve **any two** : **(2×6=12)**
   a) Discuss the rules for constructing precedence networks.
   b) With suitable example explain organization, its features and practices.
   c) Discuss ISO 12207 Software Development Life Cycle.

5. Solve **any four** : **(4×4=16)**
   a) Discuss various business pressures and how organizations responds to it.
   b) What is project management body of knowledge ?
   c) With suitable example explain how a software project differs than other engineering projects.
   d) What is change control ? What is its procedure ?
   e) Discuss Rapid Application Development (RAD) Model.

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Set Q

Set Q

SLR-TJ – 159

Seat No.	

Set **R**

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Saturday, 9-12-2017 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 option : **(1×14=14)**

1) Which of below is not a deliverable for a typical software development project ?
   a) Code b) Milestone
   c) Design document d) Testing report

2) The processes required to ensure that the project includes all the work required is called project _____ management.
   a) Scope b) Integration
   c) Procurement d) Resource

3) Take odd man out-functional requirements, quality requirements, resource requirements, risk requirements.
   a) Functional requirements b) Quality requirements
   c) Resource requirements d) Risk requirements

4) An IT project can produce
   a) System b) Software
   c) Recommendations d) All of these

P.T.O.

5) ISO/IEC _____ establishes a common framework for software life cycle processes.
   a) 2008 b) 12008
   c) 12207 d) 12208

6) An organization is a _____ and _____structure.
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   c) Formal, stable d) All of these

7) Which of below example shows mutual influence of organization and information system on each other ?
   a) Axis Bank b) Amazon
   c) IRCTC d) All of these

8) Take odd man out-tuple, relation, attribute, query
   a) Tuple b) Relation
   c) Attribute d) Query

9) Which of below is a model of B2B e commerce transaction ?
   a) Storefront b) Cyber mall
   c) Buy side Marketplace d) All of these

10) Union Bank Digi Purse is an example of
   a) e wallet b) Credit card
   c) NEFT d) RTGS

11) Take odd man out-MS Project, MS Access, DB2, Oracle
   a) MS Project b) MS Access c) DB2 d) Oracle

12) 'E' in ECM is an abbreviation for
   a) Electronic b) Enterprise c) Early d) Entire

13) Take an odd man out-NEFT, IRCTC, RTGS, PayTM
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14) Two types of data base queries are
   a) select and inform b) select and action
   c) action and shared d) inform and shared

_____

SLR-TJ – 159

Seat No.	

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Saturday, 9-12-2017 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** : **(2×6=12)**
   a) Discuss cloud computing and its types.
   b) With suitable example discuss concept of data warehouse and data mart.
   c) Discuss benefits of E Commerce to organizations.

3. Solve **any four** : **(4×4=16)**
   a) With suitable example explain ethical issue of privacy related to IS.
   b) With suitable example scenario explain one application of electronic content management.
   c) With suitable example discuss how IT supports people in an enterprise.
   d) What is E Commerce ? What is its extent ?
   e) With suitable example explain changing work practices.

SECTION – II

4. Solve **any two** : **(2×6=12)**
   a) Discuss the rules for constructing precedence networks.
   b) With suitable example explain organization, its features and practices.
   c) Discuss ISO 12207 Software Development Life Cycle.

5. Solve **any four** : **(4×4=16)**
   a) Discuss various business pressures and how organizations responds to it.
   b) What is project management body of knowledge ?
   c) With suitable example explain how a software project differs than other engineering projects.
   d) What is change control ? What is its procedure ?
   e) Discuss Rapid Application Development (RAD) Model.

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Set R

Set R

SLR-TJ – 159

Seat No.	

Set **S**

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Saturday, 9-12-2017 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 option : **(1×14=14)**

1) An organization is a _____ and _____structure.
   a) Formal, temporary b) Informal, stable
   c) Formal, stable d) All of these

2) Which of below example shows mutual influence of organization and information system on each other ?
   a) Axis Bank b) Amazon
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3) Take odd man out-tuple, relation, attribute, query
   a) Tuple b) Relation
   c) Attribute d) Query

4) Which of below is a model of B2B e commerce transaction ?
   a) Storefront b) Cyber mall
   c) Buy side Marketplace d) All of these

5) Union Bank Digi Purse is an example of
   a) e wallet b) Credit card
   c) NEFT d) RTGS

6) Take odd man out-MS Project, MS Access, DB2, Oracle
   a) MS Project b) MS Access c) DB2 d) Oracle

7) 'E' in ECM is an abbreviation for
   a) Electronic b) Enterprise c) Early d) Entire

8) Take an odd man out-NEFT, IRCTC, RTGS, PayTM
   a) NEFT b) IRCTC c) RTGS d) PayTM

9) Two types of data base queries are
   a) select and inform b) select and action
   c) action and shared d) inform and shared

10) Which of below is not a deliverable for a typical software development project ?
   a) Code b) Milestone
   c) Design document d) Testing report

11) The processes required to ensure that the project includes all the work required is called project _____ management.
   a) Scope b) Integration c) Procurement d) Resource

12) Take odd man out-functional requirements, quality requirements, resource requirements, risk requirements.
   a) Functional requirements b) Quality requirements
   c) Resource requirements d) Risk requirements

13) An IT project can produce
   a) System b) Software
   c) Recommendations d) All of these

14) ISO/IEC _____ establishes a common framework for software life cycle processes.
   a) 2008 b) 12008
   c) 12207 d) 12208

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SLR-TJ – 159

Seat No.	

T.E. (Electronics Engineering) (Part – I) (CGPA) Examination, 2017
INFORMATION TECHNOLOGY AND MANAGEMENT

Day and Date : Saturday, 9-12-2017 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** : **(2×6=12)**
   a) Discuss cloud computing and its types.
   b) With suitable example discuss concept of data warehouse and data mart.
   c) Discuss benefits of E Commerce to organizations.

3. Solve **any four** : **(4×4=16)**
   a) With suitable example explain ethical issue of privacy related to IS.
   b) With suitable example scenario explain one application of electronic content management.
   c) With suitable example discuss how IT supports people in an enterprise.
   d) What is E Commerce ? What is its extent ?
   e) With suitable example explain changing work practices.

SECTION – II

4. Solve **any two** : **(2×6=12)**
   a) Discuss the rules for constructing precedence networks.
   b) With suitable example explain organization, its features and practices.
   c) Discuss ISO 12207 Software Development Life Cycle.

5. Solve **any four** : **(4×4=16)**
   a) Discuss various business pressures and how organizations responds to it.
   b) What is project management body of knowledge ?
   c) With suitable example explain how a software project differs than other engineering projects.
   d) What is change control ? What is its procedure ?
   e) Discuss Rapid Application Development (RAD) Model.

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Set S

Set S

SLR-TJ – 161

Seat No.	

Set **P**

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Tuesday, 21-11-2017 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) *Figures to the* ***right*** *indicates* ***full*** *marks.*
5) *Assume suitable data if* ***necessary****.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) A process is selected from the _____ queue by the _____ scheduler, to be executed.
   a) blocked, short term
   b) wait, long term
   c) ready, short term
   d) ready, long term

2) Response time is
   a) The total time taken from the submission time till the completion time
   b) The total time taken from the submission time till the first response is produced
   c) The total time taken from submission time till the response is output
   d) None of these

3) For a deadlock recovery, if the resources are always preempted from the same process, _____ can occur.
   a) deadlock b) system crash c) aging d) starvation

4) Semaphore is a/an _____ to solve the critical section problem.
   a) hardware for a system
   b) special program for a system
   c) integer variable
   d) none of these

5) The Zero Capacity queue
   a) is referred to as a message system with buffering
   b) is referred to as a message system with no buffering
   c) is referred to as a link
   d) none of these

P.T.O.

6) A system is in a safe state only if there exists a
   a) safe allocation b) safe resource c) safe sequence d) all of these
7) Termination of the process terminates
   a) first thread of the process b) first two threads of the process
   c) all threads within the process d) no thread within the process
8) Which of the following is not the type of directory structure ?
   a) Single Level b) Two Level c) Three Level d) Tree Structured
9) To load the file into the memory and to run it, which of the following file operation is used ?
   a) read b) write c) execute d) append
10) _____ is the memory management scheme that supports the user view of memory.
   a) Paging b) Segmentation c) Multilevel paging d) All
11) Virtual memory concept can be implemented using _____ method.
   a) demand paging b) demand segmentation
   c) demand hardware d) both a and b
12) If the bit is set of _____ indicates that the associated page is both legal and in memory.
   a) Valid b) Invalid c) Dirty d) Shared
13) When an application uses _____ system call, the execution of the application is suspended.
   a) non-blocking b) blocking c) buffering d) exit
14) Swapping requires a _____ which is a fast disk.
   a) backing store b) paging c) segmentation d) none of above

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SLR-TJ – 161

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Tuesday, 21-11-2017 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. Attempt **any four** : **(4×4=16)**

1) State and explain the various states that a process can be in with a neat sketch of process state diagram.

2) Define deadlock. State and explain the conditions that characterize a deadlock.

3) Explain different scheduling criteria that must be kept in mind while choosing different scheduling algorithms.

4) Define thread. List some advantages of threads over the traditional processes.

5) Write a short note on batch operating systems.

3. Attempt **any two**: **(2×6=12)**

1) Elaborate the following methods for recovering a system from deadlock.
   i) Process termination
   ii) Resource preemption.

2) Describe the following terms :
   i) Long term scheduler
   ii) Short term scheduler
   iii) Medium term scheduler.

3) Consider five processes P1, P2, P3, P4 and P5 with their arrival times and with their required CPU burst in milliseconds.

Process	CPU burst time (ms)	Arrival time
P1	10	0
P2	6	1
P3	4	4
P4	2	4
P5	5	5

i) How will these processes be scheduled according to FCFS and SJF scheduling algorithm ?

ii) Draw the Gantt chart for FCFS and SJF scheduling algorithm.

iii) Compute the average waiting time and average turnaround time.

SECTION – II

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

1) List and explain different file attributes.

2) Describe the concept of dynamic linking and dynamic loading.

3) What is multi level paging ? Explain.

4) What is virtual memory ? Describe with the help of a diagram.

5) Write a note on : Interrupt driven I/O cycle.

5. Answer **any two** : **(2×6=12)**

1) Draw and explain the Life Cycle of I/O request.

2) Explain following terms :
   a) Swapping
   b) Internal and External Fragmentation.

3) Explain FIFO and optimal page replacement algorithms.

   Consider the four frames and the page reference string is as follows :

   1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 3, 6

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SLR-TJ – 161

Seat No.	

Set **Q**

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Tuesday, 21-11-2017 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) *Figures to the **right** indicates **full** marks.*
5) *Assume suitable data if **necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Which of the following is not the type of directory structure ?
   a) Single Level b) Two Level c) Three Level d) Tree Structured

2) To load the file into the memory and to run it, which of the following file operation is used ?
   a) read b) write c) execute d) append

3) _____ is the memory management scheme that supports the user view of memory.
   a) Paging b) Segmentation c) Multilevel paging d) All

4) Virtual memory concept can be implemented using _____ method.
   a) demand paging b) demand segmentation
   c) demand hardware d) both a and b

5) If the bit is set of _____ indicates that the associated page is both legal and in memory.
   a) Valid b) Invalid c) Dirty d) Shared

6) When an application uses _____ system call, the execution of the application is suspended.
   a) non-blocking b) blocking c) buffering d) exit

7) Swapping requires a _____ which is a fast disk.
   a) backing store b) paging c) segmentation d) none of above

P.T.O.

8) A process is selected from the _____ queue by the _____ scheduler, to be executed.
   a) blocked, short term
   b) wait, long term
   c) ready, short term
   d) ready, long term

9) Response time is
   a) The total time taken from the submission time till the completion time
   b) The total time taken from the submission time till the first response is produced
   c) The total time taken from submission time till the response is output
   d) None of these

10) For a deadlock recovery, if the resources are always preempted from the same process, _____ can occur.
   a) deadlock b) system crash c) aging d) starvation

11) Semaphore is a/an _____ to solve the critical section problem.
   a) hardware for a system
   b) special program for a system
   c) integer variable
   d) none of these

12) The Zero Capacity queue
   a) is referred to as a message system with buffering
   b) is referred to as a message system with no buffering
   c) is referred to as a link
   d) none of these

13) A system is in a safe state only if there exists a
   a) safe allocation b) safe resource c) safe sequence d) all of these

14) Termination of the process terminates
   a) first thread of the process
   b) first two threads of the process
   c) all threads within the process
   d) no thread within the process

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SLR-TJ – 161

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Tuesday, 21-11-2017 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. Attempt **any four** : **(4×4=16)**

1) State and explain the various states that a process can be in with a neat sketch of process state diagram.

2) Define deadlock. State and explain the conditions that characterize a deadlock.

3) Explain different scheduling criteria that must be kept in mind while choosing different scheduling algorithms.

4) Define thread. List some advantages of threads over the traditional processes.

5) Write a short note on batch operating systems.

3. Attempt **any two**: **(2×6=12)**

1) Elaborate the following methods for recovering a system from deadlock.
   i) Process termination
   ii) Resource preemption.

2) Describe the following terms :
   i) Long term scheduler
   ii) Short term scheduler
   iii) Medium term scheduler.

3) Consider five processes P1, P2, P3, P4 and P5 with their arrival times and with their required CPU burst in milliseconds.

Process	CPU burst time (ms)	Arrival time
P1	10	0
P2	6	1
P3	4	4
P4	2	4
P5	5	5

i) How will these processes be scheduled according to FCFS and SJF scheduling algorithm ?

ii) Draw the Gantt chart for FCFS and SJF scheduling algorithm.

iii) Compute the average waiting time and average turnaround time.

SECTION – II

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

1) List and explain different file attributes.

2) Describe the concept of dynamic linking and dynamic loading.

3) What is multi level paging ? Explain.

4) What is virtual memory ? Describe with the help of a diagram.

5) Write a note on : Interrupt driven I/O cycle.

5. Answer **any two** : **(2×6=12)**

1) Draw and explain the Life Cycle of I/O request.

2) Explain following terms :
   a) Swapping
   b) Internal and External Fragmentation.

3) Explain FIFO and optimal page replacement algorithms.

   Consider the four frames and the page reference string is as follows :

   1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 3, 6

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SLR-TJ – 161

Seat No.	

Set **R**

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Tuesday, 21-11-2017 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) *Figures to the* ***right*** *indicates* ***full*** *marks.*
5) *Assume suitable data if* ***necessary****.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The Zero Capacity queue
   a) is referred to as a message system with buffering
   b) is referred to as a message system with no buffering
   c) is referred to as a link
   d) none of these

2) A system is in a safe state only if there exists a
   a) safe allocation b) safe resource c) safe sequence d) all of these

3) Termination of the process terminates
   a) first thread of the process b) first two threads of the process
   c) all threads within the process d) no thread within the process

4) Which of the following is not the type of directory structure ?
   a) Single Level b) Two Level c) Three Level d) Tree Structured

5) To load the file into the memory and to run it, which of the following file operation is used ?
   a) read b) write c) execute d) append

6) _____ is the memory management scheme that supports the user view of memory.
   a) Paging b) Segmentation c) Multilevel paging d) All

7) Virtual memory concept can be implemented using _____ method.
   a) demand paging b) demand segmentation
   c) demand hardware d) both a and b

P.T.O.

8) If the bit is set of _____ indicates that the associated page is both legal and in memory.
   a) Valid b) Invalid c) Dirty d) Shared

9) When an application uses _____ system call, the execution of the application is suspended.
   a) non-blocking b) blocking c) buffering d) exit

10) Swapping requires a _____ which is a fast disk.
   a) backing store b) paging c) segmentation d) none of above

11) A process is selected from the _____ queue by the _____ scheduler, to be executed.
   a) blocked, short term b) wait, long term
   c) ready, short term d) ready, long term

12) Response time is
   a) The total time taken from the submission time till the completion time
   b) The total time taken from the submission time till the first response is produced
   c) The total time taken from submission time till the response is output
   d) None of these

13) For a deadlock recovery, if the resources are always preempted from the same process, _____ can occur.
   a) deadlock b) system crash c) aging d) starvation

14) Semaphore is a/an _____ to solve the critical section problem.
   a) hardware for a system b) special program for a system
   c) integer variable d) none of these

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SLR-TJ – 161

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Tuesday, 21-11-2017 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. Attempt **any four** : **(4×4=16)**

1) State and explain the various states that a process can be in with a neat sketch of process state diagram.

2) Define deadlock. State and explain the conditions that characterize a deadlock.

3) Explain different scheduling criteria that must be kept in mind while choosing different scheduling algorithms.

4) Define thread. List some advantages of threads over the traditional processes.

5) Write a short note on batch operating systems.

3. Attempt **any two**: **(2×6=12)**

1) Elaborate the following methods for recovering a system from deadlock.
   i) Process termination
   ii) Resource preemption.

2) Describe the following terms :
   i) Long term scheduler
   ii) Short term scheduler
   iii) Medium term scheduler.

3) Consider five processes P1, P2, P3, P4 and P5 with their arrival times and with their required CPU burst in milliseconds.

Process	CPU burst time (ms)	Arrival time
P1	10	0
P2	6	1
P3	4	4
P4	2	4
P5	5	5

i) How will these processes be scheduled according to FCFS and SJF scheduling algorithm ?

ii) Draw the Gantt chart for FCFS and SJF scheduling algorithm.

iii) Compute the average waiting time and average turnaround time.

SECTION – II

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

1) List and explain different file attributes.

2) Describe the concept of dynamic linking and dynamic loading.

3) What is multi level paging ? Explain.

4) What is virtual memory ? Describe with the help of a diagram.

5) Write a note on : Interrupt driven I/O cycle.

5. Answer **any two** : **(2×6=12)**

1) Draw and explain the Life Cycle of I/O request.

2) Explain following terms :
   a) Swapping
   b) Internal and External Fragmentation.

3) Explain FIFO and optimal page replacement algorithms.

   Consider the four frames and the page reference string is as follows :

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SLR-TJ – 161

Seat No.	

Set **S**

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Tuesday, 21-11-2017 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) *Figures to the* ***right*** *indicates* ***full*** *marks.*
5) *Assume suitable data if* ***necessary****.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) _____ is the memory management scheme that supports the user view of memory.
   a) Paging b) Segmentation c) Multilevel paging d) All

2) Virtual memory concept can be implemented using _____ method.
   a) demand paging b) demand segmentation
   c) demand hardware d) both a and b

3) If the bit is set of _____ indicates that the associated page is both legal and in memory.
   a) Valid b) Invalid c) Dirty d) Shared

4) When an application uses _____ system call, the execution of the application is suspended.
   a) non-blocking b) blocking c) buffering d) exit

5) Swapping requires a _____ which is a fast disk.
   a) backing store b) paging c) segmentation d) none of above

6) A process is selected from the _____ queue by the _____ scheduler, to be executed.
   a) blocked, short term b) wait, long term
   c) ready, short term d) ready, long term

P.T.O.

7) Response time is
   a) The total time taken from the submission time till the completion time
   b) The total time taken from the submission time till the first response is produced
   c) The total time taken from submission time till the response is output
   d) None of these

8) For a deadlock recovery, if the resources are always preempted from the same process, _____ can occur.
   a) deadlock b) system crash c) aging d) starvation

9) Semaphore is a/an _____ to solve the critical section problem.
   a) hardware for a system b) special program for a system
   c) integer variable d) none of these

10) The Zero Capacity queue
   a) is referred to as a message system with buffering
   b) is referred to as a message system with no buffering
   c) is referred to as a link
   d) none of these

11) A system is in a safe state only if there exists a
   a) safe allocation b) safe resource c) safe sequence d) all of these

12) Termination of the process terminates
   a) first thread of the process b) first two threads of the process
   c) all threads within the process d) no thread within the process

13) Which of the following is not the type of directory structure ?
   a) Single Level b) Two Level c) Three Level d) Tree Structured

14) To load the file into the memory and to run it, which of the following file operation is used ?
   a) read b) write c) execute d) append

SLR-TJ – 161

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
OPERATING SYSTEM

Day and Date : Tuesday, 21-11-2017 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. Attempt **any four** : **(4×4=16)**

1) State and explain the various states that a process can be in with a neat sketch of process state diagram.

2) Define deadlock. State and explain the conditions that characterize a deadlock.

3) Explain different scheduling criteria that must be kept in mind while choosing different scheduling algorithms.

4) Define thread. List some advantages of threads over the traditional processes.

5) Write a short note on batch operating systems.

3. Attempt **any two**: **(2×6=12)**

1) Elaborate the following methods for recovering a system from deadlock.
   i) Process termination
   ii) Resource preemption.

2) Describe the following terms :
   i) Long term scheduler
   ii) Short term scheduler
   iii) Medium term scheduler.

3) Consider five processes P1, P2, P3, P4 and P5 with their arrival times and with their required CPU burst in milliseconds.

Process	CPU burst time (ms)	Arrival time
P1	10	0
P2	6	1
P3	4	4
P4	2	4
P5	5	5

i) How will these processes be scheduled according to FCFS and SJF scheduling algorithm ?

ii) Draw the Gantt chart for FCFS and SJF scheduling algorithm.

iii) Compute the average waiting time and average turnaround time.

SECTION – II

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

1) List and explain different file attributes.

2) Describe the concept of dynamic linking and dynamic loading.

3) What is multi level paging ? Explain.

4) What is virtual memory ? Describe with the help of a diagram.

5) Write a note on : Interrupt driven I/O cycle.

5. Answer **any two** : **(2×6=12)**

1) Draw and explain the Life Cycle of I/O request.

2) Explain following terms :
   a) Swapping
   b) Internal and External Fragmentation.

3) Explain FIFO and optimal page replacement algorithms.

   Consider the four frames and the page reference string is as follows :

   1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 3, 6

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SLR-TJ – 162

Seat No.	

Set P

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day and Date : Wednesday, 22-11-2017 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) Figures to the right indicates **full** marks.*
*5) Assume suitable data **if necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks :14

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

1) Matched filter may be optimally used only for
   a) Gaussian noise b) Transit time noise
   c) Flicker d) All of the above

2) In uniform quantization process
   a) The step size remains same
   b) Step size varies according to the values of the input signal
   c) The quantizer has linear characteristics
   d) Both a) and c) are correct

3) The modulation techniques used to convert analog signal into digital signal are
   a) Pulse code modulation b) Delta modulation
   c) Adaptive delta modulation d) All of the above

4) One of the disadvantages of PCM is
   a) It requires large bandwidth b) Very high noise
   c) Cannot be decoded easily d) All of the above

P.T.O.

5) The channel capacity according to Shannon's equation is
   a) Maximum error free communication
   b) Defined for optimum system
   c) Information transmitted
   d) All of the above

6) The information rate R for given average information H = 2.0 for analog signal band limited to B Hz is
   a) 8 B bits/sec c
   b) 4 B bits/sec
   c) 2 B bits/sec
   d) 16 B bits/sec

7) For decoding in convolution coding, in a code tree
   a) Diverge upward when a bit is 0 and diverge downward when the bit is 1
   b) Diverge downward when a bit is 0 and diverge upward when the bit is 1
   c) Diverge left when a bit is 0 and diverge right when the bit is 1
   d) Diverge right when a bit is 0 and diverge left when the bit is 1

8) Parity check bit coding is used for
   a) Error correction
   b) Error detection
   c) Error correction and detection
   d) None of the above

9) The probability of error of DPSK is _____ than that of BPSK.
   a) Higher b) Lower c) Same d) Not predictable

10) QPSK is a modulation scheme where each symbol consists of
   a) 4 bits
   b) 2 bits
   c) 1 bit
   d) M number of bits, depending upon the requirement

11) The data rate of QPSK is _____ of BPSK.
   a) Thrice
   b) Four times
   c) Twice
   d) Same

12) Minimum shift keying is similar to
   a) Continuous phase frequency shift keying
   b) Binary phase shift shift keying
   c) Binary frequency shift keying
   d) QPSK

13) For a noise to be white Gaussian noise, the optimum filter is known as
   a) Low pass filter
   b) Baseband filter
   c) Matched filter
   d) Bessel filter

14) The number of bits of data transmitted per second is called
   a) Data signaling rate
   b) Modulation rate
   c) Coding
   d) None of the above

SLR-TJ – 162

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day and Date : Wednesday, 22-11-2017 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. Attempt **any four** : **16**
   a) Define the term Signals, Band pass signals, Baseband signal.
   b) Explain a PWM modulator using IC 555.
   c) Define the Information Theory and Mutual Information.
   d) State the limitations of Delta modulation.
   e) Verify the expression : I(X;Y) = I(Y;X).

3. Attempt **any two** : **12**
   a) With suitable diagram, explain DPCM modulator and demodulator.
   b) Derive the expression for condition of maximum entropy.
   c) A DMS X has five symbols x_1, x_2, x_3, x_4 And x_5 with 0.4, 0.19, 0.16, 0.15 and 0.1 respectively. Construct a Shannon Fanno code for X and calculate the efficiency of the code.

SECTION – II

4. Attempt **any four** : **16**
   a) Explain generation of ASK from baseband signal.
   b) What is ARQ ? Explain its type.
   c) Explain Matched Filter BPSK Detector.

d) Find the systematic (7, 4) cyclic code for message [0 1 1 1] and $g(x) = 1 + x + x^3$.

e) Draw block diagram of syndrome decoder linear block code.

5. Attempt **any two** : **12**

a) With suitable waveforms, explain QPSK and OQPSK.

b) An error control code has the following parity check matrix.

$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}$$

i) Determine the generator matrix G.

ii) Find the code word that begin with 101

iii) Decode the received code word 1 1 0 1 1 0.

c) Explain QAM modulator and demodulator.

SLR-TJ – 162

Seat No.	

Set Q

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day and Date : Wednesday, 22-11-2017 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) Figures to the right indicates **full** marks.*
*5) Assume suitable data **if necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks :14

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

1) Parity check bit coding is used for
   a) Error correction b) Error detection
   c) Error correction and detection d) None of the above

2) The probability of error of DPSK is _____ than that of BPSK.
   a) Higher b) Lower c) Same d) Not predictable

3) QPSK is a modulation scheme where each symbol consists of
   a) 4 bits
   b) 2 bits
   c) 1 bit
   d) M number of bits, depending upon the requirement

4) The data rate of QPSK is _____ of BPSK.
   a) Thrice b) Four times
   c) Twice d) Same

5) Minimum shift keying is similar to
   a) Continuous phase frequency shift keying
   b) Binary phase shift shift keying
   c) Binary frequency shift keying
   d) QPSK

P.T.O.

6) For a noise to be white Gaussian noise, the optimum filter is known as
   a) Low pass filter
   b) Baseband filter
   c) Matched filter
   d) Bessel filter

7) The number of bits of data transmitted per second is called
   a) Data signaling rate
   b) Modulation rate
   c) Coding
   d) None of the above

8) Matched filter may be optimally used only for
   a) Gaussian noise
   b) Transit time noise
   c) Flicker
   d) All of the above

9) In uniform quantization process
   a) The step size remains same
   b) Step size varies according to the values of the input signal
   c) The quantizer has linear characteristics
   d) Both a) and c) are correct

10) The modulation techniques used to convert analog signal into digital signal are
   a) Pulse code modulation
   b) Delta modulation
   c) Adaptive delta modulation
   d) All of the above

11) One of the disadvantages of PCM is
   a) It requires large bandwidth
   b) Very high noise
   c) Cannot be decoded easily
   d) All of the above

12) The channel capacity according to Shannon's equation is
   a) Maximum error free communication
   b) Defined for optimum system
   c) Information transmitted
   d) All of the above

13) The information rate R for given average information H = 2.0 for analog signal band limited to B Hz is
   a) 8 B bits/sec c
   b) 4 B bits/sec
   c) 2 B bits/sec
   d) 16 B bits/sec

14) For decoding in convolution coding, in a code tree
   a) Diverge upward when a bit is 0 and diverge downward when the bit is 1
   b) Diverge downward when a bit is 0 and diverge upward when the bit is 1
   c) Diverge left when a bit is 0 and diverge right when the bit is 1
   d) Diverge right when a bit is 0 and diverge left when the bit is 1

SLR-TJ – 162

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day and Date : Wednesday, 22-11-2017 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. Attempt **any four** : **16**
   a) Define the term Signals, Band pass signals, Baseband signal.
   b) Explain a PWM modulator using IC 555.
   c) Define the Information Theory and Mutual Information.
   d) State the limitations of Delta modulation.
   e) Verify the expression : I(X;Y) = I(Y;X).

3. Attempt **any two** : **12**
   a) With suitable diagram, explain DPCM modulator and demodulator.
   b) Derive the expression for condition of maximum entropy.
   c) A DMS X has five symbols x_1, x_2, x_3, x_4 And x_5 with 0.4, 0.19, 0.16, 0.15 and 0.1 respectively. Construct a Shannon Fanno code for X and calculate the efficiency of the code.

SECTION – II

4. Attempt **any four** : **16**
   a) Explain generation of ASK from baseband signal.
   b) What is ARQ ? Explain its type.
   c) Explain Matched Filter BPSK Detector.

d) Find the systematic (7, 4) cyclic code for message [0 1 1 1] and $g(x) = 1 + x + x^3$.

e) Draw block diagram of syndrome decoder linear block code.

5. Attempt **any two** : **12**

a) With suitable waveforms, explain QPSK and OQPSK.

b) An error control code has the following parity check matrix.

$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}$$

i) Determine the generator matrix G.

ii) Find the code word that begin with 101

iii) Decode the received code word 1 1 0 1 1 0.

c) Explain QAM modulator and demodulator.

SLR-TJ – 162

Seat No.	

Set R

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day and Date : Wednesday, 22-11-2017 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) Figures to the right indicates **full** marks.*
*5) Assume suitable data **if necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks :14

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

1) The channel capacity according to Shannon's equation is
   a) Maximum error free communication
   b) Defined for optimum system
   c) Information transmitted
   d) All of the above

2) The information rate R for given average information H = 2.0 for analog signal band limited to B Hz is
   a) 8 B bits/sec c
   b) 4 B bits/sec
   c) 2 B bits/sec
   d) 16 B bits/sec

3) For decoding in convolution coding, in a code tree
   a) Diverge upward when a bit is 0 and diverge downward when the bit is 1
   b) Diverge downward when a bit is 0 and diverge upward when the bit is 1
   c) Diverge left when a bit is 0 and diverge right when the bit is 1
   d) Diverge right when a bit is 0 and diverge left when the bit is 1

4) Parity check bit coding is used for
   a) Error correction
   b) Error detection
   c) Error correction and detection
   d) None of the above

5) The probability of error of DPSK is _____ than that of BPSK.
   a) Higher b) Lower c) Same d) Not predictable

6) QPSK is a modulation scheme where each symbol consists of
   a) 4 bits
   b) 2 bits
   c) 1 bit
   d) M number of bits, depending upon the requirement

7) The data rate of QPSK is _____ of BPSK.
   a) Thrice b) Four times
   c) Twice d) Same

8) Minimum shift keying is similar to
   a) Continuous phase frequency shift keying
   b) Binary phase shift shift keying
   c) Binary frequency shift keying
   d) QPSK

9) For a noise to be white Gaussian noise, the optimum filter is known as
   a) Low pass filter b) Baseband filter
   c) Matched filter d) Bessel filter

10) The number of bits of data transmitted per second is called
   a) Data signaling rate b) Modulation rate
   c) Coding d) None of the above

11) Matched filter may be optimally used only for
   a) Gaussian noise b) Transit time noise
   c) Flicker d) All of the above

12) In uniform quantization process
   a) The step size remains same
   b) Step size varies according to the values of the input signal
   c) The quantizer has linear characteristics
   d) Both a) and c) are correct

13) The modulation techniques used to convert analog signal into digital signal are
   a) Pulse code modulation b) Delta modulation
   c) Adaptive delta modulation d) All of the above

14) One of the disadvantages of PCM is
   a) It requires large bandwidth b) Very high noise
   c) Cannot be decoded easily d) All of the above

SLR-TJ – 162

Seat No.	

T.E. – I (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day and Date : Wednesday, 22-11-2017 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. Attempt **any four** : **16**
   a) Define the term Signals, Band pass signals, Baseband signal.
   b) Explain a PWM modulator using IC 555.
   c) Define the Information Theory and Mutual Information.
   d) State the limitations of Delta modulation.
   e) Verify the expression : I(X;Y) = I(Y;X).

3. Attempt **any two** : **12**
   a) With suitable diagram, explain DPCM modulator and demodulator.
   b) Derive the expression for condition of maximum entropy.
   c) A DMS X has five symbols x_1, x_2, x_3, x_4 And x_5 with 0.4, 0.19, 0.16, 0.15 and 0.1 respectively. Construct a Shannon Fanno code for X and calculate the efficiency of the code.

SECTION – II

4. Attempt **any four** : **16**
   a) Explain generation of ASK from baseband signal.
   b) What is ARQ ? Explain its type.
   c) Explain Matched Filter BPSK Detector.

Set R

d) Find the systematic (7, 4) cyclic code for message [0 1 1 1] and $g(x) = 1 + x + x^3$.

e) Draw block diagram of syndrome decoder linear block code.

5. Attempt **any two** : **12**

a) With suitable waveforms, explain QPSK and OQPSK.

b) An error control code has the following parity check matrix.

$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}$$

i) Determine the generator matrix G.

ii) Find the code word that begin with 101

iii) Decode the received code word 1 1 0 1 1 0.

c) Explain QAM modulator and demodulator.

SLR-TJ – 162

Seat No.	

Set S

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day and Date :Wednesday, 22-11-2017 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) Figures to the right indicates **full** marks.*
*5) Assume suitable data **if necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks :14

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

1) QPSK is a modulation scheme where each symbol consists of
   a) 4 bits
   b) 2 bits
   c) 1 bit
   d) M number of bits, depending upon the requirement

2) The data rate of QPSK is _____ of BPSK.
   a) Thrice b) Four times
   c) Twice d) Same

3) Minimum shift keying is similar to
   a) Continuous phase frequency shift keying
   b) Binary phase shift shift keying
   c) Binary frequency shift keying
   d) QPSK

4) For a noise to be white Gaussian noise, the optimum filter is known as
   a) Low pass filter b) Baseband filter
   c) Matched filter d) Bessel filter

P.T.O.

5) The number of bits of data transmitted per second is called
   a) Data signaling rate b) Modulation rate
   c) Coding d) None of the above

6) Matched filter may be optimally used only for
   a) Gaussian noise b) Transit time noise
   c) Flicker d) All of the above

7) In uniform quantization process
   a) The step size remains same
   b) Step size varies according to the values of the input signal
   c) The quantizer has linear characteristics
   d) Both a) and c) are correct

8) The modulation techniques used to convert analog signal into digital signal are
   a) Pulse code modulation b) Delta modulation
   c) Adaptive delta modulation d) All of the above

9) One of the disadvantages of PCM is
   a) It requires large bandwidth b) Very high noise
   c) Cannot be decoded easily d) All of the above

10) The channel capacity according to Shannon's equation is
   a) Maximum error free communication
   b) Defined for optimum system
   c) Information transmitted
   d) All of the above

11) The information rate R for given average information H = 2.0 for analog signal band limited to B Hz is
   a) 8 B bits/sec c b) 4 B bits/sec
   c) 2 B bits/sec d) 16 B bits/sec

12) For decoding in convolution coding, in a code tree
   a) Diverge upward when a bit is 0 and diverge downward when the bit is 1
   b) Diverge downward when a bit is 0 and diverge upward when the bit is 1
   c) Diverge left when a bit is 0 and diverge right when the bit is 1
   d) Diverge right when a bit is 0 and diverge left when the bit is 1

13) Parity check bit coding is used for
   a) Error correction b) Error detection
   c) Error correction and detection d) None of the above

14) The probability of error of DPSK is _____ than that of BPSK.
   a) Higher b) Lower c) Same d) Not predictable

SLR-TJ – 162

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day and Date : Wednesday, 22-11-2017 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. Attempt **any four** : **16**
   a) Define the term Signals, Band pass signals, Baseband signal.
   b) Explain a PWM modulator using IC 555.
   c) Define the Information Theory and Mutual Information.
   d) State the limitations of Delta modulation.
   e) Verify the expression I(X;Y) = I(Y;X).

3. Attempt **any two** : **12**
   a) With suitable diagram, explain DPCM modulator and demodulator.
   b) Derive the expression for condition of maximum entropy.
   c) A DMS X has five symbols x_1, x_2, x_3, x_4 And x_5 with 0.4, 0.19, 0.16, 0.15 and 0.1 respectively. Construct a Shannon Fanno code for X and calculate the efficiency of the code.

SECTION – II

4. Attempt **any four** : **16**
   a) Explain generation of ASK from baseband signal.
   b) What is ARQ ? Explain its type.
   c) Explain Matched Filter BPSK Detector.

d) Find the systematic (7, 4) cyclic code for message [0 1 1 1] and $g(x) = 1 + x + x^3$.

e) Draw block diagram of syndrome decoder linear block code.

5. Attempt **any two** : **12**

a) With suitable waveforms, explain QPSK and OQPSK.

b) An error control code has the following parity check matrix.

$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}$$

i) Determine the generator matrix G.

ii) Find the code word that begin with 101

iii) Decode the received code word 1 1 0 1 1 0.

c) Explain QAM modulator and demodulator.

SLR-TJ – 163

Seat No.	

Set **P**

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS

Day and Date : Thursday, 23-11-2017 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 alternative : **(14×1=14)**

1) In 8051 a Timer 1 interrupt vector address is of
a) 000 Bh b) 001 Bh c) 001 3h d) 002 3h

2) When 8051 is powered up, stack begin at
a) 07 h b) 70 h c) 08 h d) 80 h

3) _____ of 8051 does not have internal pull-up registers.
a) Port 3 b) Port 2 c) Port 1 d) Port 0

4) The assembler of 8051 requires _____ extension file as an input.
a) hex b) asm c) obj d) bin

5) In 8051, serial communication mode 1 the baud rate will be
a) Variable b) fosc/164 c) fosc/32 d) fosc/12

6) _____ registers can be used as memory pointer in indirect addressing mode.
a) r0 and r1 b) r0 to r7
c) r0 and r1 from each bank d) r0 and r1 from bank 0

7) What is the address range of SFR Register bank in 8051 ?
   a) 00H-77H b) 40H-80H c) 80H-7FH d) 80H-FFH

8) The PIC 16F877 has _____ bytes on chip EEPROM data memory.
   a) 192 b) 128 c) 368 d) 256

9) Timer 2 of the PIC 16F877 is _____ bit, accessed as _____.
   a) 8, timer/counter b) 16, timer/counter
   c) 8, timer d) 8, counter

10) In PIC 16F877 reset vector is at _____ in program memory.
   a) 0000 h b) 0004 h c) 0040 h d) 0400 h

11) The _____ pins can become the I/O control inputs for the parallel slave port.
   a) PORT A b) PORT B c) PORT D d) PORT E

12) The PIC 16F877 MSSP module in I^2C mode, implements _____ bit and _____ bit addressing.
   a) 7, 10 b) 10, 8 c) 7, 8 d) 11, 7

13) Operating CCP1 module in PWM mode, PWM period can be set by writing to _____ register.
   a) PR1 b) TMR2 c) PR2 d) CCP1RL

14) In PIC to make Port B an input port, we must place _____ in register _____.
   a) 00 h, PORTB b) FF h, PORTB c) 00 h, TRISB d) FF h, TRISB

_____

SLR-TJ – 163

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS

Day and Date : Thursday, 23-11-2017 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. Solve **any four** : **(4×4=16)**

a) Explain Port 0 structure in detail.

b) Write a 8051 program to find largest number from a given array of 10 elements.

c) Explain modes of operation of timers in 8051.

d) Write 8051 assembly program to toggle the bit P2.7 continuously every 500 ms. Use Timer 1, mode 1, XTAL = 11.0592 MHz.

e) Explain the use of IE and IP registers in 8051.

3. Solve **any two** : **(6×2=12)**

a) Explain serial communication in 8051. Write a 8051 assembly program to transfer the message “TRUE” serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.

b) Draw and explain interfacing of 16*2 LCD to 8051. Write a program to display “ABC” from second row-fifth column.

c) Interface of DAC to 8051. Write a program
   i) To generate triangular wave
   ii) To generate a saw tooth wave.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Write PIC program to add two 16 bit numbers.

   b) Draw and explain bit format of STATUS register in PIC 16F877.

   c) With block diagram explain Timer-2 module used in PIC microcontroller.

   d) Write the steps to reading the EEPROM data memory in PIC and write a program for the same.

   e) Explain the parallel slave port mode of operation in PIC.

5. Solve **any two** : **(6×2=12)**

   a) Explain the following instructions with their syntax.
      1) BTFSS 2) DECFSZ 3) RETLW 4) IORWF

   b) How do you operate CCP module in PWM mode ? Explain PWM operation.

   c) Explain serial peripheral interface in PIC.

SLR-TJ – 163

Seat No.	

Set Q

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS

Day and Date : Thursday, 23-11-2017 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 alternative : **(14×1=14)**

1) The PIC 16F877 has _____ bytes on chip EEPROM data memory.
a) 192 b) 128 c) 368 d) 256

2) Timer 2 of the PIC 16F877 is _____ bit, accessed as _____.
a) 8, timer/counter b) 16, timer/counter
c) 8, timer d) 8, counter

3) In PIC 16F877 reset vector is at _____ in program memory.
a) 0000 h b) 0004 h c) 0040 h d) 0400 h

4) The _____ pins can become the I/O control inputs for the parallel slave port.
a) PORT A b) PORT B c) PORT D d) PORT E

5) The PIC 16F877 MSSP module in I^2C mode, implements _____ bit and _____ bit addressing.
a) 7, 10 b) 10, 8 c) 7, 8 d) 11, 7

6) Operating CCP1 module in PWM mode, PWM period can be set by writing to _____ register.
a) PR1 b) TMR2 c) PR2 d) CCP1RL

P.T.O.

7) In PIC to make Port B an input port, we must place _____ in register _____.
   a) 00 h, PORTB b) FF h, PORTB c) 00 h, TRISB d) FF h, TRISB

8) In 8051 a Timer 1 interrupt vector address is of
   a) 000 Bh b) 001 Bh c) 001 3h d) 002 3h

9) When 8051 is powered up, stack begin at
   a) 07 h b) 70 h c) 08 h d) 80 h

10) _____ of 8051 does not have internal pull-up registers.
   a) Port 3 b) Port 2 c) Port 1 d) Port 0

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 1 the baud rate will be
   a) Variable b) fosc/164 c) fosc/32 d) fosc/12

13) _____ registers can be used as memory pointer in indirect addressing mode.
   a) r0 and r1 b) r0 to r7
   c) r0 and r1 from each bank d) r0 and r1 from bank 0

14) What is the address range of SFR Register bank in 8051 ?
   a) 00H-77H b) 40H-80H c) 80H-7FH d) 80H-FFH

_____

SLR-TJ – 163

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS

Day and Date : Thursday, 23-11-2017 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. Solve **any four** : **(4×4=16)**

a) Explain Port 0 structure in detail.

b) Write a 8051 program to find largest number from a given array of 10 elements.

c) Explain modes of operation of timers in 8051.

d) Write 8051 assembly program to toggle the bit P2.7 continuously every 500 ms. Use Timer 1, mode 1, XTAL = 11.0592 MHz.

e) Explain the use of IE and IP registers in 8051.

3. Solve **any two** : **(6×2=12)**

a) Explain serial communication in 8051. Write a 8051 assembly program to transfer the message “TRUE” serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.

b) Draw and explain interfacing of 16*2 LCD to 8051. Write a program to display “ABC” from second row-fifth column.

c) Interface of DAC to 8051. Write a program
   i) To generate triangular wave
   ii) To generate a saw tooth wave.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Write PIC program to add two 16 bit numbers.

   b) Draw and explain bit format of STATUS register in PIC 16F877.

   c) With block diagram explain Timer-2 module used in PIC microcontroller.

   d) Write the steps to reading the EEPROM data memory in PIC and write a program for the same.

   e) Explain the parallel slave port mode of operation in PIC.

5. Solve **any two** : **(6×2=12)**

   a) Explain the following instructions with their syntax.
      1) BTFSS 2) DECFSZ 3) RETLW 4) IORWF

   b) How do you operate CCP module in PWM mode ? Explain PWM operation.

   c) Explain serial peripheral interface in PIC.

SLR-TJ – 163

Seat No.	

Set **R**

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS

Day and Date : Thursday, 23-11-2017 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 alternative : **(14×1=14)**

1) In 8051, serial communication mode 1 the baud rate will be
a) Variable b) fosc/164 c) fosc/32 d) fosc/12

2) _____ registers can be used as memory pointer in indirect addressing mode.
a) r0 and r1 b) r0 to r7
c) r0 and r1 from each bank d) r0 and r1 from bank 0

3) What is the address range of SFR Register bank in 8051 ?
a) 00H-77H b) 40H-80H c) 80H-7FH d) 80H-FFH

4) The PIC 16F877 has _____ bytes on chip EEPROM data memory.
a) 192 b) 128 c) 368 d) 256

5) Timer 2 of the PIC 16F877 is _____ bit, accessed as _____.
a) 8, timer/counter b) 16, timer/counter
c) 8, timer d) 8, counter

6) In PIC 16F877 reset vector is at _____ in program memory.
a) 0000 h b) 0004 h c) 0040 h d) 0400 h

7) The _____ pins can become the I/O control inputs for the parallel slave port.
   a) PORT A b) PORT B c) PORT D d) PORT E

8) The PIC 16F877 MSSP module in I^2C mode, implements _____ bit and _____ bit addressing.
   a) 7, 10 b) 10, 8 c) 7, 8 d) 11, 7

9) Operating CCP1 module in PWM mode, PWM period can be set by writing to _____ register.
   a) PR1 b) TMR2 c) PR2 d) CCP1RL

10) In PIC to make Port B an input port, we must place _____ in register _____.
   a) 00 h, PORTB b) FF h, PORTB c) 00 h, TRISB d) FF h, TRISB

11) In 8051 a Timer 1 interrupt vector address is of
   a) 000 Bh b) 001 Bh c) 001 3h d) 002 3h

12) When 8051 is powered up, stack begin at
   a) 07 h b) 70 h c) 08 h d) 80 h

13) _____ of 8051 does not have internal pull-up registers.
   a) Port 3 b) Port 2 c) Port 1 d) Port 0

14) The assembler of 8051 requires _____ extension file as an input.
   a) hex b) asm c) obj d) bin

_____

SLR-TJ – 163

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS

Day and Date : Thursday, 23-11-2017 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. Solve **any four** : **(4×4=16)**

a) Explain Port 0 structure in detail.

b) Write a 8051 program to find largest number from a given array of 10 elements.

c) Explain modes of operation of timers in 8051.

d) Write 8051 assembly program to toggle the bit P2.7 continuously every 500 ms. Use Timer 1, mode 1, XTAL = 11.0592 MHz.

e) Explain the use of IE and IP registers in 8051.

3. Solve **any two** : **(6×2=12)**

a) Explain serial communication in 8051. Write a 8051 assembly program to transfer the message “TRUE” serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.

b) Draw and explain interfacing of 16*2 LCD to 8051. Write a program to display “ABC” from second row-fifth column.

c) Interface of DAC to 8051. Write a program
   i) To generate triangular wave
   ii) To generate a saw tooth wave.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Write PIC program to add two 16 bit numbers.

   b) Draw and explain bit format of STATUS register in PIC 16F877.

   c) With block diagram explain Timer-2 module used in PIC microcontroller.

   d) Write the steps to reading the EEPROM data memory in PIC and write a program for the same.

   e) Explain the parallel slave port mode of operation in PIC.

5. Solve **any two** : **(6×2=12)**

   a) Explain the following instructions with their syntax.
      1) BTFSS 2) DECFSZ 3) RETLW 4) IORWF

   b) How do you operate CCP module in PWM mode ? Explain PWM operation.

   c) Explain serial peripheral interface in PIC.

SLR-TJ – 163

Seat No.	

Set **S**

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS

Day and Date : Thursday, 23-11-2017 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 alternative : **(14×1=14)**

1) In PIC 16F877 reset vector is at _____ in program memory.
a) 0000 h b) 0004 h c) 0040 h d) 0400 h

2) The _____ pins can become the I/O control inputs for the parallel slave port.
a) PORT A b) PORT B c) PORT D d) PORT E

3) The PIC 16F877 MSSP module in I^2C mode, implements _____ bit and _____ bit addressing.
a) 7, 10 b) 10, 8 c) 7, 8 d) 11, 7

4) Operating CCP1 module in PWM mode, PWM period can be set by writing to _____ register.
a) PR1 b) TMR2 c) PR2 d) CCP1RL

5) In PIC to make Port B an input port, we must place _____ in register _____.
a) 00 h, PORTB b) FF h, PORTB c) 00 h, TRISB d) FF h, TRISB

6) In 8051 a Timer 1 interrupt vector address is of
a) 000 Bh b) 001 Bh c) 001 3h d) 002 3h

P.T.O.

7) When 8051 is powered up, stack begin at
   a) 07 h b) 70 h c) 08 h d) 80 h

8) _____ of 8051 does not have internal pull-up registers.
   a) Port 3 b) Port 2 c) Port 1 d) Port 0

9) The assembler of 8051 requires _____ extension file as an input.
   a) hex b) asm c) obj d) bin

10) In 8051, serial communication mode 1 the baud rate will be
   a) Variable b) fosc/164 c) fosc/32 d) fosc/12

11) _____ registers can be used as memory pointer in indirect addressing mode.
   a) r0 and r1 b) r0 to r7
   c) r0 and r1 from each bank d) r0 and r1 from bank 0

12) What is the address range of SFR Register bank in 8051 ?
   a) 00H-77H b) 40H-80H c) 80H-7FH d) 80H-FFH

13) The PIC 16F877 has _____ bytes on chip EEPROM data memory.
   a) 192 b) 128 c) 368 d) 256

14) Timer 2 of the PIC 16F877 is _____ bit, accessed as _____.
   a) 8, timer/counter b) 16, timer/counter
   c) 8, timer d) 8, counter

_____

SLR-TJ – 163

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
MICROCONTROLLERS

Day and Date : Thursday, 23-11-2017 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. Solve **any four** : **(4×4=16)**

a) Explain Port 0 structure in detail.

b) Write a 8051 program to find largest number from a given array of 10 elements.

c) Explain modes of operation of timers in 8051.

d) Write 8051 assembly program to toggle the bit P2.7 continuously every 500 ms. Use Timer 1, mode 1, XTAL = 11.0592 MHz.

e) Explain the use of IE and IP registers in 8051.

3. Solve **any two** : **(6×2=12)**

a) Explain serial communication in 8051. Write a 8051 assembly program to transfer the message “TRUE” serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.

b) Draw and explain interfacing of 16*2 LCD to 8051. Write a program to display “ABC” from second row-fifth column.

c) Interface of DAC to 8051. Write a program
   i) To generate triangular wave
   ii) To generate a saw tooth wave.

SECTION – II

4. Solve **any four** : **(4×4=16)**

   a) Write PIC program to add two 16 bit numbers.

   b) Draw and explain bit format of STATUS register in PIC 16F877.

   c) With block diagram explain Timer-2 module used in PIC microcontroller.

   d) Write the steps to reading the EEPROM data memory in PIC and write a program for the same.

   e) Explain the parallel slave port mode of operation in PIC.

5. Solve **any two** : **(6×2=12)**

   a) Explain the following instructions with their syntax.
      1) BTFSS 2) DECFSZ 3) RETLW 4) IORWF

   b) How do you operate CCP module in PWM mode ? Explain PWM operation.

   c) Explain serial peripheral interface in PIC.

SLR-TJ – 164

Seat No.	

Set **P**

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Friday, 24-11-2017 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) 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 : **(14×1=14)**

1) Class D commutation technique is also called as _____ commutation.
a) Voltage b) Auxilarly c) Impulse d) All above

2) Average value of output voltage for single phase fully controlled converter with inductive load is
a) $\frac{V_m}{\sqrt{2}}$ b) $\frac{2V_m}{\pi}\cos\alpha$ c) $0.707\ V_m$ d) both a) and c)

3) PIV rating of TRIAC is
a) Same as thyristor
b) Greater than thyristor
c) Inferior and very much less than thyristor
d) Not very significant due to nature of its application

4) Which of the following PNPN device does not have gate terminal ?
a) TRIAC b) DIAC c) SCS d) SUS

5) MOSFET's are suitable for
a) Low voltage switching b) High voltage switching
c) Low power d) None

6) Inductor is used in series with the thyristor to
a) reduce over voltage b) to reduce dv/dt
c) trigger thyristor d) to protect from high di/dt

P.T.O.

7) A freewheeling diode is placed across inductive load
   a) To prevent reversal of load voltage
   b) Transfer load current away from source
   c) To maintain constant dc level
   d) Both a) and b)

8) Optocoupler provides _____ between firing circuit and power circuit.
   a) Direct coupling b) Isolation
   c) Impedance matching d) Protection

9) Constant voltage transformer uses principle of
   a) Ferro resonance b) Parallel resonance
   c) Series resonance d) Series and parallel resonance

10) Forward converter is derived from _____ converter.
   a) Buck b) Boost c) Buck-Boost d) Step-up

11) In _____, the heating is uniform throughout work piece.
   a) Dielectric heating b) Induction heating
   c) Resistance heating d) Infrared heating

12) LASCR's
   a) Light Amplification SCR
   b) Used in low voltage and low current applications
   c) Light Activated SCR
   d) Used in AC control applications

13) To turn on an SCS device, a _____ pulse must be applied to the anode gate terminal; to turn off the device, a _____ pulse is required.
   a) positive, positive b) negative, positive
   c) positive, negative d) negative, negative

14) The output voltage of boost converter is
   a) Less than input b) More than input
   c) Equal to input d) None of above

_____

SLR-TJ – 164

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Friday, 24-11-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) Explain the working of single phase fully controlled converter with RLE load.
   2) Explain working of over voltage and over current protections circuits for power devices.
   3) With the help of structural diagram of GTO, explain what are different modification are made in conventional thyristor to improve turn off performance.
   4) Explain working of Class B resonant pulse commutation. Sketch associated waveforms.
   5) Explain working of dual converter for circulating current mode with associated waveforms.

3. Attempt **any two** : **(2×6=12)**
   1) With the help of two transistor model of SCR prove that thyristor is latching device and derive an expression for its anode current.
   2) Sketch V – I characteristics of TRIAC and explain switching action in different triggering modes.
   3) A single phase semiconverter is to supply dc power in to load of 20Ω. If converter is supplied by 350 V single phase, 50 Hz AC supply and output voltage across load is 40% of maximum dc voltage.
      a) Firing angle.
      b) Calculate dc output voltage and RMS output voltage.
      c) Draw voltage and current waveforms.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) With suitable circuit diagram explain working of single phase preventer system.
   2) Explain working of batch counter system.
   3) Explain working of voltage stabilizer using relays.
   4) With suitable block diagram explain working of switched mode AC power supply.
   5) Explain UJT as a relaxation oscillator. Derive an expression for frequency of oscillation.

5. Attempt **any two** : **(2×6=12)**
   1) Explain working of forward converter and sketch associated waveforms.
   2) With help of block diagram explain triggering scheme for single phase controlled rectifier.
   3) Draw neat circuit diagram of resistance triggering and RC triggering method for SCR and explain its operation.

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SLR-TJ – 164

Seat No.	

Set **Q**

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Friday, 24-11-2017 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) 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 : **(14×1=14)**

1) Optocoupler provides _____ between firing circuit and power circuit.
   a) Direct coupling b) Isolation
   c) Impedance matching d) Protection

2) Constant voltage transformer uses principle of
   a) Ferro resonance b) Parallel resonance
   c) Series resonance d) Series and parallel resonance

3) Forward converter is derived from _____ converter.
   a) Buck b) Boost c) Buck-Boost d) Step-up

4) In _____, the heating is uniform throughout work piece.
   a) Dielectric heating b) Induction heating
   c) Resistance heating d) Infrared heating

5) LASCR's
   a) Light Amplification SCR
   b) Used in low voltage and low current applications
   c) Light Activated SCR
   d) Used in AC control applications

6) To turn on an SCS device, a _____ pulse must be applied to the anode gate terminal; to turn off the device, a _____ pulse is required.
   a) positive, positive b) negative, positive
   c) positive, negative d) negative, negative

P.T.O.

7) The output voltage of boost converter is
   a) Less than input b) More than input
   c) Equal to input d) None of above

8) Class D commutation technique is also called as _____ commutation.
   a) Voltage b) Auxilarly c) Impulse d) All above

9) Average value of output voltage for single phase fully controlled converter with inductive load is
   a) $\frac{V_m}{\sqrt{2}}$ b) $\frac{2V_m}{\pi}\cos\alpha$ c) $0.707\,V_m$ d) both a) and c)

10) PIV rating of TRIAC is
   a) Same as thyristor
   b) Greater than thyristor
   c) Inferior and very much less than thyristor
   d) Not very significant due to nature of its application

11) Which of the following PNPN device does not have gate terminal ?
   a) TRIAC b) DIAC c) SCS d) SUS

12) MOSFET's are suitable for
   a) Low voltage switching b) High voltage switching
   c) Low power d) None

13) Inductor is used in series with the thyristor to
   a) reduce over voltage b) to reduce dv/dt
   c) trigger thyristor d) to protect from high di/dt

14) A freewheeling diode is placed across inductive load
   a) To prevent reversal of load voltage
   b) Transfer load current away from source
   c) To maintain constant dc level
   d) Both a) and b)

_____

SLR-TJ – 164

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Friday, 24-11-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) Explain the working of single phase fully controlled converter with RLE load.
   2) Explain working of over voltage and over current protections circuits for power devices.
   3) With the help of structural diagram of GTO, explain what are different modification are made in conventional thyristor to improve turn off performance.
   4) Explain working of Class B resonant pulse commutation. Sketch associated waveforms.
   5) Explain working of dual converter for circulating current mode with associated waveforms.

3. Attempt **any two** : **(2×6=12)**
   1) With the help of two transistor model of SCR prove that thyristor is latching device and derive an expression for its anode current.
   2) Sketch V – I characteristics of TRIAC and explain switching action in different triggering modes.
   3) A single phase semiconverter is to supply dc power in to load of 20Ω. If converter is supplied by 350 V single phase, 50 Hz AC supply and output voltage across load is 40% of maximum dc voltage.
      a) Firing angle.
      b) Calculate dc output voltage and RMS output voltage.
      c) Draw voltage and current waveforms.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) With suitable circuit diagram explain working of single phase preventer system.
   2) Explain working of batch counter system.
   3) Explain working of voltage stabilizer using relays.
   4) With suitable block diagram explain working of switched mode AC power supply.
   5) Explain UJT as a relaxation oscillator. Derive an expression for frequency of oscillation.

5. Attempt **any two** : **(2×6=12)**
   1) Explain working of forward converter and sketch associated waveforms.
   2) With help of block diagram explain triggering scheme for single phase controlled rectifier.
   3) Draw neat circuit diagram of resistance triggering and RC triggering method for SCR and explain its operation.

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SLR-TJ – 164

Seat No.	

Set **R**

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Friday, 24-11-2017 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) 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 : **(14×1=14)**

1) MOSFET's are suitable for
   a) Low voltage switching b) High voltage switching
   c) Low power d) None

2) Inductor is used in series with the thyristor to
   a) reduce over voltage b) to reduce dv/dt
   c) trigger thyristor d) to protect from high di/dt

3) A freewheeling diode is placed across inductive load
   a) To prevent reversal of load voltage
   b) Transfer load current away from source
   c) To maintain constant dc level
   d) Both a) and b)

4) Optocoupler provides _____ between firing circuit and power circuit.
   a) Direct coupling b) Isolation
   c) Impedance matching d) Protection

5) Constant voltage transformer uses principle of
   a) Ferro resonance b) Parallel resonance
   c) Series resonance d) Series and parallel resonance

6) Forward converter is derived from _____ converter.
   a) Buck b) Boost c) Buck-Boost d) Step-up

P.T.O.

7) In _____, the heating is uniform throughout work piece.
   a) Dielectric heating b) Induction heating
   c) Resistance heating d) Infrared heating

8) LASCR's
   a) Light Amplification SCR
   b) Used in low voltage and low current applications
   c) Light Activated SCR
   d) Used in AC control applications

9) To turn on an SCS device, a _____ pulse must be applied to the anode gate terminal; to turn off the device, a _____ pulse is required.
   a) positive, positive b) negative, positive
   c) positive, negative d) negative, negative

10) The output voltage of boost converter is
   a) Less than input b) More than input
   c) Equal to input d) None of above

11) Class D commutation technique is also called as _____ commutation.
   a) Voltage b) Auxilarly c) Impulse d) All above

12) Average value of output voltage for single phase fully controlled converter with inductive load is
   a) $\frac{V_m}{\sqrt{2}}$ b) $\frac{2V_m}{\pi}\cos\alpha$ c) $0.707\,V_m$ d) both a) and c)

13) PIV rating of TRIAC is
   a) Same as thyristor
   b) Greater than thyristor
   c) Inferior and very much less than thyristor
   d) Not very significant due to nature of its application

14) Which of the following PNPN device does not have gate terminal ?
   a) TRIAC b) DIAC c) SCS d) SUS

_____

SLR-TJ – 164

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Friday, 24-11-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) Explain the working of single phase fully controlled converter with RLE load.
   2) Explain working of over voltage and over current protections circuits for power devices.
   3) With the help of structural diagram of GTO, explain what are different modification are made in conventional thyristor to improve turn off performance.
   4) Explain working of Class B resonant pulse commutation. Sketch associated waveforms.
   5) Explain working of dual converter for circulating current mode with associated waveforms.

3. Attempt **any two** : **(2×6=12)**
   1) With the help of two transistor model of SCR prove that thyristor is latching device and derive an expression for its anode current.
   2) Sketch V – I characteristics of TRIAC and explain switching action in different triggering modes.
   3) A single phase semiconverter is to supply dc power in to load of 20Ω. If converter is supplied by 350 V single phase, 50 Hz AC supply and output voltage across load is 40% of maximum dc voltage.
      a) Firing angle.
      b) Calculate dc output voltage and RMS output voltage.
      c) Draw voltage and current waveforms.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) With suitable circuit diagram explain working of single phase preventer system.
   2) Explain working of batch counter system.
   3) Explain working of voltage stabilizer using relays.
   4) With suitable block diagram explain working of switched mode AC power supply.
   5) Explain UJT as a relaxation oscillator. Derive an expression for frequency of oscillation.

5. Attempt **any two** : **(2×6=12)**
   1) Explain working of forward converter and sketch associated waveforms.
   2) With help of block diagram explain triggering scheme for single phase controlled rectifier.
   3) Draw neat circuit diagram of resistance triggering and RC triggering method for SCR and explain its operation.

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SLR-TJ – 164

Seat No.	

Set **S**

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Friday, 24-11-2017 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) 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 : **(14×1=14)**

1) Forward converter is derived from _____ converter.
a) Buck b) Boost c) Buck-Boost d) Step-up

2) In _____, the heating is uniform throughout work piece.
a) Dielectric heating b) Induction heating
c) Resistance heating d) Infrared heating

3) LASCR's
a) Light Amplification SCR
b) Used in low voltage and low current applications
c) Light Activated SCR
d) Used in AC control applications

4) To turn on an SCS device, a _____ pulse must be applied to the anode gate terminal; to turn off the device, a _____ pulse is required.
a) positive, positive b) negative, positive
c) positive, negative d) negative, negative

5) The output voltage of boost converter is
a) Less than input b) More than input
c) Equal to input d) None of above

6) Class D commutation technique is also called as _____ commutation.
a) Voltage b) Auxilarly c) Impulse d) All above

P.T.O.

7) Average value of output voltage for single phase fully controlled converter with inductive load is

a) $\frac{V_m}{\sqrt{2}}$ b) $\frac{2V_m}{\pi}\cos\alpha$ c) $0.707\,V_m$ d) both a) and c)

8) PIV rating of TRIAC is
   a) Same as thyristor
   b) Greater than thyristor
   c) Inferior and very much less than thyristor
   d) Not very significant due to nature of its application

9) Which of the following PNPN device does not have gate terminal ?
   a) TRIAC b) DIAC c) SCS d) SUS

10) MOSFET's are suitable for
   a) Low voltage switching b) High voltage switching
   c) Low power d) None

11) Inductor is used in series with the thyristor to
   a) reduce over voltage b) to reduce dv/dt
   c) trigger thyristor d) to protect from high di/dt

12) A freewheeling diode is placed across inductive load
   a) To prevent reversal of load voltage
   b) Transfer load current away from source
   c) To maintain constant dc level
   d) Both a) and b)

13) Optocoupler provides _____ between firing circuit and power circuit.
   a) Direct coupling b) Isolation
   c) Impedance matching d) Protection

14) Constant voltage transformer uses principle of
   a) Ferro resonance b) Parallel resonance
   c) Series resonance d) Series and parallel resonance

_____

SLR-TJ – 164

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
INDUSTRIAL ELECTRONICS

Day and Date : Friday, 24-11-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

2. Attempt **any four** : **(4×4=16)**
   1) Explain the working of single phase fully controlled converter with RLE load.
   2) Explain working of over voltage and over current protections circuits for power devices.
   3) With the help of structural diagram of GTO, explain what are different modification are made in conventional thyristor to improve turn off performance.
   4) Explain working of Class B resonant pulse commutation. Sketch associated waveforms.
   5) Explain working of dual converter for circulating current mode with associated waveforms.

3. Attempt **any two** : **(2×6=12)**
   1) With the help of two transistor model of SCR prove that thyristor is latching device and derive an expression for its anode current.
   2) Sketch V – I characteristics of TRIAC and explain switching action in different triggering modes.
   3) A single phase semiconverter is to supply dc power in to load of 20Ω. If converter is supplied by 350 V single phase, 50 Hz AC supply and output voltage across load is 40% of maximum dc voltage.
      a) Firing angle.
      b) Calculate dc output voltage and RMS output voltage.
      c) Draw voltage and current waveforms.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   1) With suitable circuit diagram explain working of single phase preventer system.
   2) Explain working of batch counter system.
   3) Explain working of voltage stabilizer using relays.
   4) With suitable block diagram explain working of switched mode AC power supply.
   5) Explain UJT as a relaxation oscillator. Derive an expression for frequency of oscillation.

5. Attempt **any two** : **(2×6=12)**
   1) Explain working of forward converter and sketch associated waveforms.
   2) With help of block diagram explain triggering scheme for single phase controlled rectifier.
   3) Draw neat circuit diagram of resistance triggering and RC triggering method for SCR and explain its operation.

———————

SLR-TJ – 165

Seat No.	

Set P

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (CGPA)

Day and Date : Saturday, 25-11-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Process in VHDL becomes active, when
   a) There is a change in the value of signal in sensitivity list
   b) Change in clock statement
   c) Change in reset signal
   d) None of the signal

2) VHDL statement

   Op <= input when e = '1' else 'z'; infers

   a) 2 : 1 multiplexer b) Tristate buffer
   c) Buffer d) None of these

3) Assuming the left operand as BIT – vector, "1001010" rol 2 is
   a) "0101011" b) "0101000" c) "0101010" d) None of these

4) The delay model models the delays introduced by wiring which simply delays the signal by specified delay is _____
   a) Transport b) Inertial c) Delta d) None of these

5) Which of the following feature can be used to specify the parameters for a component at the time of instantiation ?
   a) Generate b) Attribute
   c) Generics d) Signals

P.T.O.

6) When the following signal assignment statement executes at 10 ns, the new value will be assigned to signal at what time ?

X <= 5 after 10 ns ;

a) 10 ns; b) 10 ns + Δ c) 20 ns d) 20 ns + Δ

7) Which of the following statement is not used in the behavioral architecture ?

a) Loop b) Exit c) Wait d) Port map

8) CPLD contains several PAL type simple programmable logic devices called _____

a) Macro cells b) Microcells
c) AND-OR arrays d) Fuse Link Array

9) Noise margin of CMOS inverter is not function of

a) W/L of MOS b) B_n/B_p c) t_{ox} d) All of the above

10) Microcells' whose output are usable only internally are called _____

a) Feedback b) Internal c) Buried d) None of these

11) The power dissipation of CMOS IC will _____

a) Decreases with increase in frequency
b) Increases with gate size
c) Decreases with gate size
d) Increases with increase in frequency

12) Boundary Scan technique consists of _____

a) Scan path testing port b) Test Access port
c) Both a) and b) d) None of the above

13) To check the functional correctness of the design, _____ can be done.

a) Simulation b) Synthesis c) Translate d) Filter

14) Transmission gate in CMOS is also called as _____

a) Pass Gate b) Transfer Gate
c) Pull-up Gate d) Pull-down Gate

_____

SLR-TJ – 165

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (CGPA)

Day and Date : Saturday, 25-11-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) Explain in brief different shift operators in VHDL with suitable example.

b) Consider A = “101”, B = “110” and C = “011110” obtain following
   i) C sll 3
   ii) C ror 2
   iii) (A & B) and C
   iv) Not A xor B.

c) Write VHDL code for 4 : 1 multiplexer with behavioral architecture.

d) Write VHDL test bench for testing 4 : 1 multiplexer.

e) Write VHDL code for T flip flop with asynchronous reset.

3. Solve **any two** : **(2×6=12)**

a) Write VHDL code for serial in Parallel out shift register with synchronous reset.

b) Write VHDL code for a Melay FSM to detect the sequence 110 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

c) Explain following features of VHDL with appropriate example :
   i) Generate and
   ii) Generics.

SECTION – II

4. Solve **any four** : **(4×4=16)**

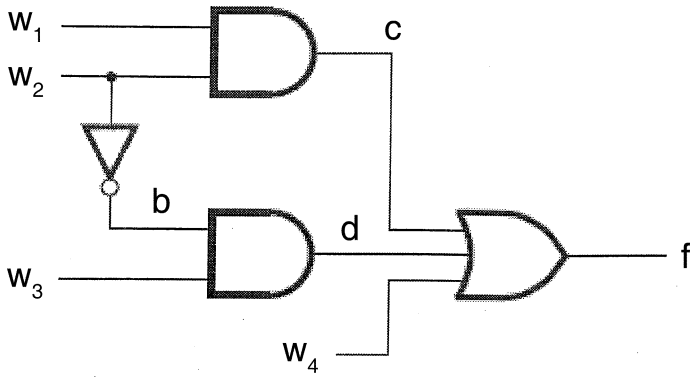
   a) Differentiate between CPLD and FPGA.

   b) Explain place and route process of EDA tools.

   c) Explain VHDL synthesis process in brief.

   d) Explain in brief basic CMOS inverter.

   e) Explain path sensitizing. Obtain the complete test set for circuit shown below using path sensitizing.



5. Solve **any two** : **(6×2=12)**

   a) Draw and explain Xilinx 9500 series CPLD architecture.

   b) Explain in detail simulation steps in RTL simulation.

   c) Explain the following characteristics of digital circuits :

      i) Power dissipation

      ii) Noise margin

      iii) Fan in

      iv) Fan out.

SLR-TJ – 165

Seat No.	

Set Q

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (CGPA)

Day and Date : Saturday, 25-11-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) CPLD contains several PAL type simple programmable logic devices called _____
   a) Macro cells b) Microcells
   c) AND-OR arrays d) Fuse Link Array

2) Noise margin of CMOS inverter is not function of
   a) W/L of MOS b) B_n/B_p c) t_{ox} d) All of the above

3) Microcells' whose output are usable only internally are called _____
   a) Feedback b) Internal c) Buried d) None of these

4) The power dissipation of CMOS IC will _____
   a) Decreases with increase in frequency
   b) Increases with gate size
   c) Decreases with gate size
   d) Increases with increase in frequency

5) Boundary Scan technique consists of _____
   a) Scan path testing port b) Test Access port
   c) Both a) and b) d) None of the above

6) To check the functional correctness of the design, _____ can be done.
   a) Simulation b) Synthesis c) Translate d) Filter

P.T.O.

7) Transmission gate in CMOS is also called as _____
   a) Pass Gate b) Transfer Gate
   c) Pull-up Gate d) Pull-down Gate

8) Process in VHDL becomes active, when
   a) There is a change in the value of signal in sensitivity list
   b) Change in clock statement
   c) Change in reset signal
   d) None of the signal

9) VHDL statement

   Op <= input when e = '1' else 'z'; infers
   a) 2 : 1 multiplexer b) Tristate buffer
   c) Buffer d) None of these

10) Assuming the left operand as BIT – vector, "1001010" rol 2 is
   a) "0101011" b) "0101000" c) "0101010" d) None of these

11) The delay model models the delays introduced by wiring which simply delays the signal by specified delay is _____
   a) Transport b) Inertial c) Delta d) None of these

12) Which of the following feature can be used to specify the parameters for a component at the time of instantiation ?
   a) Generate b) Attribute
   c) Generics d) Signals

13) When the following signal assignment statement executes at 10 ns, the new value will be assigned to signal at what time ?

   X <= 5 after 10 ns ;
   a) 10 ns; b) 10 ns + Δ c) 20 ns d) 20 ns + Δ

14) Which of the following statement is not used in the behavioral architecture ?
   a) Loop b) Exit c) Wait d) Port map

_____

SLR-TJ – 165

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (CGPA)

Day and Date : Saturday, 25-11-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) Explain in brief different shift operators in VHDL with suitable example.

b) Consider A = “101”, B = “110” and C = “011110” obtain following
   i) C sll 3
   ii) C ror 2
   iii) (A & B) and C
   iv) Not A xor B.

c) Write VHDL code for 4 : 1 multiplexer with behavioral architecture.

d) Write VHDL test bench for testing 4 : 1 multiplexer.

e) Write VHDL code for T flip flop with asynchronous reset.

3. Solve **any two** : **(2×6=12)**

a) Write VHDL code for serial in Parallel out shift register with synchronous reset.

b) Write VHDL code for a Melay FSM to detect the sequence 110 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

c) Explain following features of VHDL with appropriate example :
   i) Generate and
   ii) Generics.

SECTION – II

4. Solve **any four** : **(4×4=16)**

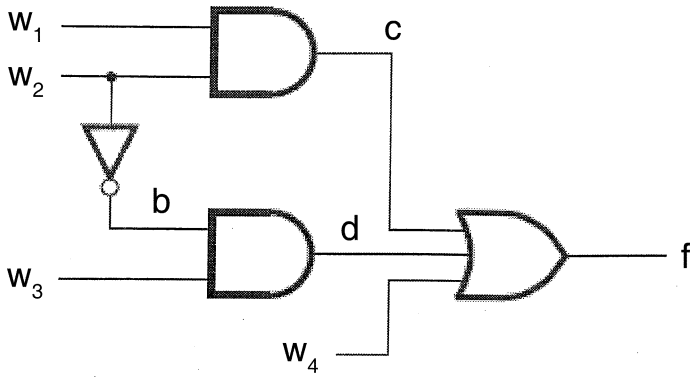
   a) Differentiate between CPLD and FPGA.

   b) Explain place and route process of EDA tools.

   c) Explain VHDL synthesis process in brief.

   d) Explain in brief basic CMOS inverter.

   e) Explain path sensitizing. Obtain the complete test set for circuit shown below using path sensitizing.



5. Solve **any two** : **(6×2=12)**

   a) Draw and explain Xilinx 9500 series CPLD architecture.

   b) Explain in detail simulation steps in RTL simulation.

   c) Explain the following characteristics of digital circuits :

      i) Power dissipation

      ii) Noise margin

      iii) Fan in

      iv) Fan out.

SLR-TJ – 165

Seat No.	

Set R

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (CGPA)

Day and Date : Saturday, 25-11-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Which of the following feature can be used to specify the parameters for a component at the time of instantiation ?
   a) Generate b) Attribute
   c) Generics d) Signals

2) When the following signal assignment statement executes at 10 ns, the new value will be assigned to signal at what time ?
   X <= 5 after 10 ns ;
   a) 10 ns; b) 10 ns + Δ c) 20 ns d) 20 ns + Δ

3) Which of the following statement is not used in the behavioral architecture ?
   a) Loop b) Exit c) Wait d) Port map

4) CPLD contains several PAL type simple programmable logic devices called _____
   a) Macro cells b) Microcells
   c) AND-OR arrays d) Fuse Link Array

5) Noise margin of CMOS inverter is not function of
   a) W/L of MOS b) B_n/B_p c) t_{ox} d) All of the above

6) Microcells' whose output are usable only internally are called _____
   a) Feedback b) Internal c) Buried d) None of these

P.T.O.

7) The power dissipation of CMOS IC will _____
   a) Decreases with increase in frequency
   b) Increases with gate size
   c) Decreases with gate size
   d) Increases with increase in frequency

8) Boundary Scan technique consists of _____
   a) Scan path testing port b) Test Access port
   c) Both a) and b) d) None of the above

9) To check the functional correctness of the design, _____ can be done.
   a) Simulation b) Synthesis c) Translate d) Filter

10) Transmission gate in CMOS is also called as _____
   a) Pass Gate b) Transfer Gate
   c) Pull-up Gate d) Pull-down Gate

11) Process in VHDL becomes active, when
   a) There is a change in the value of signal in sensitivity list
   b) Change in clock statement
   c) Change in reset signal
   d) None of the signal

12) VHDL statement

   Op <= input when e = '1' else 'z'; infers

   a) 2 : 1 multiplexer b) Tristate buffer
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13) Assuming the left operand as BIT – vector, "1001010" rol 2 is
   a) "0101011" b) "0101000" c) "0101010" d) None of these

14) The delay model models the delays introduced by wiring which simply delays the signal by specified delay is _____
   a) Transport b) Inertial c) Delta d) None of these

_____

SLR-TJ – 165

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (CGPA)

Day and Date : Saturday, 25-11-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) Explain in brief different shift operators in VHDL with suitable example.

b) Consider A = “101”, B = “110” and C = “011110” obtain following
   i) C sll 3
   ii) C ror 2
   iii) (A & B) and C
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c) Write VHDL code for 4 : 1 multiplexer with behavioral architecture.

d) Write VHDL test bench for testing 4 : 1 multiplexer.

e) Write VHDL code for T flip flop with asynchronous reset.

3. Solve **any two** : **(2×6=12)**

a) Write VHDL code for serial in Parallel out shift register with synchronous reset.

b) Write VHDL code for a Melay FSM to detect the sequence 110 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

c) Explain following features of VHDL with appropriate example :
   i) Generate and
   ii) Generics.

SECTION – II

4. Solve **any four** : **(4×4=16)**

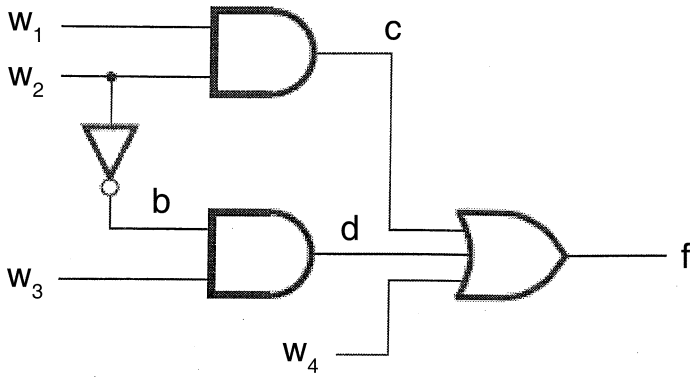
a) Differentiate between CPLD and FPGA.

b) Explain place and route process of EDA tools.

c) Explain VHDL synthesis process in brief.

d) Explain in brief basic CMOS inverter.

e) Explain path sensitizing. Obtain the complete test set for circuit shown below using path sensitizing.



5. Solve **any two** : **(6×2=12)**

a) Draw and explain Xilinx 9500 series CPLD architecture.

b) Explain in detail simulation steps in RTL simulation.

c) Explain the following characteristics of digital circuits :

i) Power dissipation

ii) Noise margin

iii) Fan in

iv) Fan out.

SLR-TJ – 165

Seat No.	

Set S

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (CGPA)

Day and Date : Saturday, 25-11-2017 Max. Marks : 70
Time : 10.00 a.m. to 1.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) Microcells' whose output are usable only internally are called _____
   a) Feedback b) Internal
   c) Buried d) None of these

2) The power dissipation of CMOS IC will _____
   a) Decreases with increase in frequency
   b) Increases with gate size
   c) Decreases with gate size
   d) Increases with increase in frequency

3) Boundary Scan technique consists of _____
   a) Scan path testing port b) Test Access port
   c) Both a) and b) d) None of the above

4) To check the functional correctness of the design, _____ can be done.
   a) Simulation b) Synthesis
   c) Translate d) Filter

5) Transmission gate in CMOS is also called as _____
   a) Pass Gate b) Transfer Gate
   c) Pull-up Gate d) Pull-down Gate

P.T.O.

6) Process in VHDL becomes active, when
   a) There is a change in the value of signal in sensitivity list
   b) Change in clock statement
   c) Change in reset signal
   d) None of the signal

7) VHDL statement

   Op <= input when e = '1' else 'z'; infers

   a) 2 : 1 multiplexer
   b) Tristate buffer
   c) Buffer
   d) None of these

8) Assuming the left operand as BIT – vector, "1001010" rol 2 is
   a) "0101011" b) "0101000" c) "0101010" d) None of these

9) The delay model models the delays introduced by wiring which simply delays the signal by specified delay is _____
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10) Which of the following feature can be used to specify the parameters for a component at the time of instantiation ?
   a) Generate
   b) Attribute
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11) When the following signal assignment statement executes at 10 ns, the new value will be assigned to signal at what time ?

   X <= 5 after 10 ns ;

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12) Which of the following statement is not used in the behavioral architecture ?
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13) CPLD contains several PAL type simple programmable logic devices called _____
   a) Macro cells
   b) Microcells
   c) AND-OR arrays
   d) Fuse Link Array

14) Noise margin of CMOS inverter is not function of
   a) W/L of MOS b) B_n/B_p c) t_{ox} d) All of the above

SLR-TJ – 165

Seat No.	

T.E. (Electronics Engineering) (Part – II) Examination, 2017
VLSI DESIGN (CGPA)

Day and Date : Saturday, 25-11-2017 Marks : 56
Time : 10.00 a.m. to 1.00 p.m.

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

SECTION – I

2. Solve **any four** : **(4×4=16)**

a) Explain in brief different shift operators in VHDL with suitable example.

b) Consider A = “101”, B = “110” and C = “011110” obtain following
   i) C sll 3
   ii) C ror 2
   iii) (A & B) and C
   iv) Not A xor B.

c) Write VHDL code for 4 : 1 multiplexer with behavioral architecture.

d) Write VHDL test bench for testing 4 : 1 multiplexer.

e) Write VHDL code for T flip flop with asynchronous reset.

3. Solve **any two** : **(2×6=12)**

a) Write VHDL code for serial in Parallel out shift register with synchronous reset.

b) Write VHDL code for a Melay FSM to detect the sequence 110 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

c) Explain following features of VHDL with appropriate example :
   i) Generate and
   ii) Generics.

SECTION – II

4. Solve **any four** : **(4×4=16)**

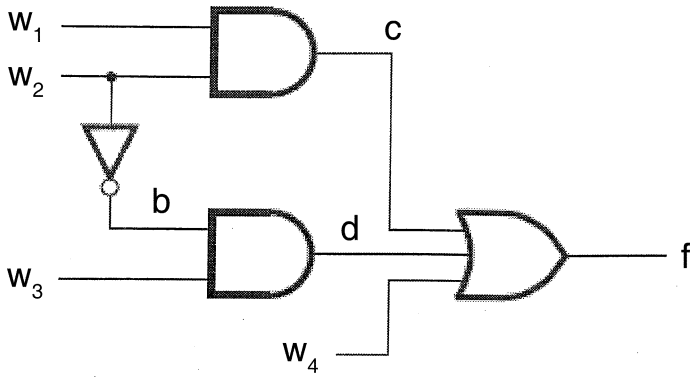
a) Differentiate between CPLD and FPGA.

b) Explain place and route process of EDA tools.

c) Explain VHDL synthesis process in brief.

d) Explain in brief basic CMOS inverter.

e) Explain path sensitizing. Obtain the complete test set for circuit shown below using path sensitizing.



5. Solve **any two** : **(6×2=12)**

a) Draw and explain Xilinx 9500 series CPLD architecture.

b) Explain in detail simulation steps in RTL simulation.

c) Explain the following characteristics of digital circuits :

i) Power dissipation

ii) Noise margin

iii) Fan in

iv) Fan out.

SLR-TJ – 166

Seat No.	

Set **P**

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Technical Self Learning Module – III)

Day and Date : Monday, 27-11-2017 Max. Marks : 50
Time : 10.00 a.m. to 12.00 noon

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

MCQ/Objective Type Questions

Marks : 10

1. Choose the correct answer : **10**

1) If the air-fuel mixture ignites before the spark takes place at spark plug, the condition is called

a) Detonation b) Ignition
c) Pre-ignition d) Rumble

2) The instrument used to check specific gravity of acid in a battery is

a) Hydrometer b) Hygrometer
c) Anemometer d) Multi-meter

3) When the battery is half (50%) charged, the specific gravity of acid in a battery is usually

a) 0.74 b) 1.00 c) 1.12 d) 1.19

4) The function of an alternator in an automobile is to

a) Supply electric power
b) Converts mechanical energy into electrical energy
c) Continually recharges the battery
d) Partly converts engine power into electric power

5) Tachometer in a vehicle measures

a) Speed b) Distance

c) Engine r.p.m. d) Fuel consumption

6) In a Diesel engine, the fuel is ignited by

a) An electric spark b) The heat of compression

c) The hot exhaust d) None of these

7) What term describes the maximum expected error associated with a measurement or a sensor ?

a) Resolution b) Precision c) Range d) Accuracy

8) An ohmmeter can be used to measure

a) Plug lead resistance b) Switch supply voltage

c) Switch output current d) All of the above

9) A 12 volt lead-acid battery has

a) Cells connected in parallel, plates connected in series

b) Cells connected in series, plates connected in parallel

c) Cells connected in series, plates connected in series

d) Cells connected in parallel, plates connected in parallel

10) 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

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SLR-TJ – 166

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Technical Self Learning Module – III)

Day and Date : Monday, 27-11-2017 Marks : 40

Time : 10.00 a.m. to 12.00 noon

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

SECTION – I

2. Attempt **any three** : **(4×3=12)**
   1) What are the different sensors used in vehicles ? Explain their sensing principle in short.
   2) How an electronic ignition system in vehicle works ?
   3) Explain present battery technology used in automobile.
   4) What are the topologies used to connect various sensors in automobiles ? Explain each in brief.

3. Attempt **any one** : **(8×1=8)**
   1) Explain temperature and speed sensing system used in automobiles.
   2) List various electric motors used in automobile along with their control systems in detail.

SECTION – II

4. Attempt **any three** : **(4×3=12)**
   1) What is actuator ? Explain pneumatic actuators related to automobiles.
   2) Explain engine control system in brief.
   3) What are the types of solenoid valves ? Draw and explain driving circuitry for solenoid valve.
   4) What is basic wiring system and multiplex wiring system used in automobile ?

5. Attempt **any one** : **(8×1=8)**
   1) Explain transmission and vehicle braking in detail.
   2) What is self-diagnostic system in automobile ? Discuss diagnostic sequence and diagnostic procedure for the same.

Set P

Set P

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Seat No.	

Set **Q**

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Technical Self Learning Module – III)

Day and Date : Monday, 27-11-2017 Max. Marks : 50
Time : 10.00 a.m. to 12.00 noon

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

MCQ/Objective Type Questions

Marks : 10

1. Choose the correct answer : **10**

1) A 12 volt lead-acid battery has

a) Cells connected in parallel, plates connected in series

b) Cells connected in series, plates connected in parallel

c) Cells connected in series, plates connected in series

d) Cells connected in parallel, plates connected in parallel

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) What term describes the maximum expected error associated with a measurement or a sensor ?

a) Resolution b) Precision c) Range d) Accuracy

4) An ohmmeter can be used to measure

a) Plug lead resistance b) Switch supply voltage

c) Switch output current d) All of the above

5) If the air-fuel mixture ignites before the spark takes place at spark plug, the condition is called

a) Detonation b) Ignition

c) Pre-ignition d) Rumble

6) The instrument used to check specific gravity of acid in a battery is

a) Hydrometer b) Hygrometer

c) Anemometer d) Multi-meter

7) When the battery is half (50%) charged, the specific gravity of acid in a battery is usually

a) 0.74 b) 1.00 c) 1.12 d) 1.19

8) The function of an alternator in an automobile is to

a) Supply electric power

b) Converts mechanical energy into electrical energy

c) Continually recharges the battery

d) Partly converts engine power into electric power

9) Tachometer in a vehicle measures

a) Speed b) Distance

c) Engine r.p.m. d) Fuel consumption

10) In a Diesel engine, the fuel is ignited by

a) An electric spark b) The heat of compression

c) The hot exhaust d) None of these

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SLR-TJ – 166

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Technical Self Learning Module – III)

Day and Date : Monday, 27-11-2017 Marks : 40

Time : 10.00 a.m. to 12.00 noon

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

SECTION – I

2. Attempt **any three** : **(4×3=12)**
   1) What are the different sensors used in vehicles ? Explain their sensing principle in short.
   2) How an electronic ignition system in vehicle works ?
   3) Explain present battery technology used in automobile.
   4) What are the topologies used to connect various sensors in automobiles ? Explain each in brief.

3. Attempt **any one** : **(8×1=8)**
   1) Explain temperature and speed sensing system used in automobiles.
   2) List various electric motors used in automobile along with their control systems in detail.

SECTION – II

4. Attempt **any three** : **(4×3=12)**
   1) What is actuator ? Explain pneumatic actuators related to automobiles.
   2) Explain engine control system in brief.
   3) What are the types of solenoid valves ? Draw and explain driving circuitry for solenoid valve.
   4) What is basic wiring system and multiplex wiring system used in automobile ?

5. Attempt **any one** : **(8×1=8)**
   1) Explain transmission and vehicle braking in detail.
   2) What is self-diagnostic system in automobile ? Discuss diagnostic sequence and diagnostic procedure for the same.

Set Q

Set Q

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Seat No.	

Set **R**

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Technical Self Learning Module – III)

Day and Date : Monday, 27-11-2017 Max. Marks : 50
Time : 10.00 a.m. to 12.00 noon

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

MCQ/Objective Type Questions

Marks : 10

1. Choose the correct answer : **10**

1) Tachometer in a vehicle measures

a) Speed b) Distance

c) Engine r.p.m. d) Fuel consumption

2) In a Diesel engine, the fuel is ignited by

a) An electric spark

b) The heat of compression

c) The hot exhaust

d) None of these

3) A 12 volt lead-acid battery has

a) Cells connected in parallel, plates connected in series

b) Cells connected in series, plates connected in parallel

c) Cells connected in series, plates connected in series

d) Cells connected in parallel, plates connected in parallel

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

5) When the battery is half (50%) charged, the specific gravity of acid in a battery is usually
   a) 0.74 b) 1.00 c) 1.12 d) 1.19

6) The function of an alternator in an automobile is to
   a) Supply electric power
   b) Converts mechanical energy into electrical energy
   c) Continually recharges the battery
   d) Partly converts engine power into electric power

7) If the air-fuel mixture ignites before the spark takes place at spark plug, the condition is called
   a) Detonation b) Ignition
   c) Pre-ignition d) Rumble

8) The instrument used to check specific gravity of acid in a battery is
   a) Hydrometer b) Hygrometer
   c) Anemometer d) Multi-meter

9) What term describes the maximum expected error associated with a measurement or a sensor ?
   a) Resolution b) Precision c) Range d) Accuracy

10) An ohmmeter can be used to measure
   a) Plug lead resistance b) Switch supply voltage
   c) Switch output current d) All of the above

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SLR-TJ – 166

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Technical Self Learning Module – III)

Day and Date : Monday, 27-11-2017 Marks : 40

Time : 10.00 a.m. to 12.00 noon

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

SECTION – I

2. Attempt **any three** : **(4×3=12)**
   1) What are the different sensors used in vehicles ? Explain their sensing principle in short.
   2) How an electronic ignition system in vehicle works ?
   3) Explain present battery technology used in automobile.
   4) What are the topologies used to connect various sensors in automobiles ? Explain each in brief.

3. Attempt **any one** : **(8×1=8)**
   1) Explain temperature and speed sensing system used in automobiles.
   2) List various electric motors used in automobile along with their control systems in detail.

SECTION – II

4. Attempt **any three** : **(4×3=12)**
   1) What is actuator ? Explain pneumatic actuators related to automobiles.
   2) Explain engine control system in brief.
   3) What are the types of solenoid valves ? Draw and explain driving circuitry for solenoid valve.
   4) What is basic wiring system and multiplex wiring system used in automobile ?

5. Attempt **any one** : **(8×1=8)**
   1) Explain transmission and vehicle braking in detail.
   2) What is self-diagnostic system in automobile ? Discuss diagnostic sequence and diagnostic procedure for the same.

Set R

Set R

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Seat No.	

Set **S**

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Technical Self Learning Module – III)

Day and Date : Monday, 27-11-2017 Max. Marks : 50
Time : 10.00 a.m. to 12.00 noon

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

MCQ/Objective Type Questions

Marks : 10

1. Choose the correct answer : **10**

1) When the battery is half (50%) charged, the specific gravity of acid in a battery is usually

a) 0.74 b) 1.00 c) 1.12 d) 1.19

2) The function of an alternator in an automobile is to

a) Supply electric power
b) Converts mechanical energy into electrical energy
c) Continually recharges the battery
d) Partly converts engine power into electric power

3) Tachometer in a vehicle measures

a) Speed b) Distance
c) Engine r.p.m. d) Fuel consumption

4) In a Diesel engine, the fuel is ignited by

a) An electric spark b) The heat of compression
c) The hot exhaust d) None of these

5) What term describes the maximum expected error associated with a measurement or a sensor ?

a) Resolution b) Precision c) Range d) Accuracy

6) An ohmmeter can be used to measure

a) Plug lead resistance b) Switch supply voltage

c) Switch output current d) All of the above

7) A 12 volt lead-acid battery has

a) Cells connected in parallel, plates connected in series

b) Cells connected in series, plates connected in parallel

c) Cells connected in series, plates connected in series

d) Cells connected in parallel, plates connected in parallel

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) If the air-fuel mixture ignites before the spark takes place at spark plug, the condition is called

a) Detonation b) Ignition

c) Pre-ignition d) Rumble

10) The instrument used to check specific gravity of acid in a battery is

a) Hydrometer b) Hygrometer

c) Anemometer d) Multi-meter

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SLR-TJ – 166

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
AUTOMOTIVE ELECTRONICS
(Technical Self Learning Module – III)

Day and Date : Monday, 27-11-2017 Marks : 40

Time : 10.00 a.m. to 12.00 noon

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

SECTION – I

2. Attempt **any three** : **(4×3=12)**
   1) What are the different sensors used in vehicles ? Explain their sensing principle in short.
   2) How an electronic ignition system in vehicle works ?
   3) Explain present battery technology used in automobile.
   4) What are the topologies used to connect various sensors in automobiles ? Explain each in brief.

3. Attempt **any one** : **(8×1=8)**
   1) Explain temperature and speed sensing system used in automobiles.
   2) List various electric motors used in automobile along with their control systems in detail.

SECTION – II

4. Attempt **any three** : **(4×3=12)**
   1) What is actuator ? Explain pneumatic actuators related to automobiles.
   2) Explain engine control system in brief.
   3) What are the types of solenoid valves ? Draw and explain driving circuitry for solenoid valve.
   4) What is basic wiring system and multiplex wiring system used in automobile ?

5. Attempt **any one** : **(8×1=8)**
   1) Explain transmission and vehicle braking in detail.
   2) What is self-diagnostic system in automobile ? Discuss diagnostic sequence and diagnostic procedure for the same.

Set S

SLR-TJ – 167

Seat No.	

Set **P**

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
ROBOTICS
Self Learning

Day and Date : Monday, 27-11-2017 Max. Marks : 50

Time : 10.00 a.m. to 12.00 noon

SECTION – I

1. Solve **any four** : **20**

   a) What are different classifications of Robot ?

   b) Explain with neat sketch “Servo Controlled Robot”.

   c) List different types of sensors used in Robots.

   d) What is the function of actuator ? Give its classification.

   e) List the type of grippers and their applications.

SECTION – II

2. Solve **any three** : **30**

   a) Explain classification of robot by control methods.

   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-TJ – 168

Seat No.	

Set P

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
ELECTRONIC INSTRUMENTATION
Self Learning

Day and Date : Monday, 27-11-2017 Max. Marks : 50
Time : 10.00 a.m. to 12.00 noon

***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 15 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 : 15 Minutes Marks : 10

1. Select suitable option : **(10×1=10)**

1) 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

2) _____ analyzers are useful when looking at time relationships or data on a bus.
   a) Spectrum b) Logic c) Wave d) Data

3) _____ analyzers are used for FFT analysis of RF signals.
   a) Spectrum b) Logic
   c) FFT d) Vector

4) Smart sensor can be designed using _____
   a) ASIC b) SOC
   c) Both a) and b) d) None of these

5) _____ is an example of smart sensor.
   a) Universal counter b) Spectrum analyzer
   c) CCD imaging d) All of these

P.T.O.

6) Digital panel meter is an example of
   a) DAS b) ADC
   c) Data logger d) None of these

7) Which of below is not a block of universal counter ?
   a) Schmitt trigger b) Decade counter
   c) Pulse width converter d) Crystal oscillator

8) LCD contains
   a) NLC fluid b) Epoxy fluid
   c) Nixie tube d) All of these

9) Mercury in glass thermometer is an example of _____ order instrument.
   a) Zero b) First
   c) Second d) None of these

10) Which of below is not a type of standard ?
   a) Primary b) Secondary
   c) Working d) None of these

_____

SLR-TJ – 168

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
ELECTRONIC INSTRUMENTATION
Self Learning

Day and Date : Monday, 27-11-2017 Marks : 40
Time : 10.00 a.m. to 12.00 noon

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) With suitable diagram explain DC signal conditioning system.
   b) Explain dynamic characteristics of an instrument.

3. Solve **any three** : **(3×4=12)**
   a) The expected value of the voltage across resistor is 80V. However the measurement gives a value of 79V. Calculate – absolute error, % error, relative accuracy, % of accuracy.
   b) With suitable diagram explain LED display.
   c) What are different types of standards ?
   d) Define the terms – accuracy, error, precision and resolution.

SECTION – II

4. Solve **any one** : **(1×8=8)**
   a) Draw and explain FFT analyzer.
   b) Draw and explain DAS.

5. Solve **any three** : **(3×4=12)**
   a) Explain any two features of smart sensor.
   b) With suitable diagram explain strip chart recorder.
   c) With suitable diagram explain ultrasonic sensor.
   d) Explain any four applications of spectrum analyzer.

Set P

Set P

SLR-TJ – 168

Seat No.	

Set Q

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
ELECTRONIC INSTRUMENTATION
Self Learning

Day and Date : Monday, 27-11-2017 Max. Marks : 50
Time : 10.00 a.m. to 12.00 noon

***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 15 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 : 15 Minutes Marks : 10

1. Select suitable option : **(10×1=10)**

1) Mercury in glass thermometer is an example of _____ order instrument.
   a) Zero b) First
   c) Second d) None of these

2) Which of below is not a type of standard ?
   a) Primary b) Secondary
   c) Working d) None of these

3) Which of below is not a block of universal counter ?
   a) Schmitt trigger b) Decade counter
   c) Pulse width converter d) Crystal oscillator

4) LCD contains
   a) NLC fluid b) Epoxy fluid
   c) Nixie tube d) All of these

P.T.O.

5) 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

6) _____ analyzers are useful when looking at time relationships or data on a bus.
   a) Spectrum b) Logic c) Wave d) Data

7) _____ analyzers are used for FFT analysis of RF signals.
   a) Spectrum b) Logic
   c) FFT d) Vector

8) Smart sensor can be designed using _____
   a) ASIC b) SOC
   c) Both a) and b) d) None of these

9) _____ is an example of smart sensor.
   a) Universal counter b) Spectrum analyzer
   c) CCD imaging d) All of these

10) Digital panel meter is an example of
   a) DAS b) ADC
   c) Data logger d) None of these

_____

SLR-TJ – 168

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
ELECTRONIC INSTRUMENTATION
Self Learning

Day and Date : Monday, 27-11-2017 Marks : 40
Time : 10.00 a.m. to 12.00 noon

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) With suitable diagram explain DC signal conditioning system.
   b) Explain dynamic characteristics of an instrument.

3. Solve **any three** : **(3×4=12)**
   a) The expected value of the voltage across resistor is 80V. However the measurement gives a value of 79V. Calculate – absolute error, % error, relative accuracy, % of accuracy.
   b) With suitable diagram explain LED display.
   c) What are different types of standards ?
   d) Define the terms – accuracy, error, precision and resolution.

SECTION – II

4. Solve **any one** : **(1×8=8)**
   a) Draw and explain FFT analyzer.
   b) Draw and explain DAS.

5. Solve **any three** : **(3×4=12)**
   a) Explain any two features of smart sensor.
   b) With suitable diagram explain strip chart recorder.
   c) With suitable diagram explain ultrasonic sensor.
   d) Explain any four applications of spectrum analyzer.

Set Q

Set Q

SLR-TJ – 168

Seat No.	

Set R

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
ELECTRONIC INSTRUMENTATION
Self Learning

Day and Date : Monday, 27-11-2017 Max. Marks : 50
Time : 10.00 a.m. to 12.00 noon

***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 15 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 : 15 Minutes Marks : 10

1. Select suitable option : **(10×1=10)**

1) _____ is an example of smart sensor.
   a) Universal counter b) Spectrum analyzer
   c) CCD imaging d) All of these

2) Digital panel meter is an example of
   a) DAS b) ADC
   c) Data logger d) None of these

3) Mercury in glass thermometer is an example of _____ order instrument.
   a) Zero b) First
   c) Second d) None of these

4) Which of below is not a type of standard ?
   a) Primary b) Secondary
   c) Working d) None of these

5) _____ analyzers are used for FFT analysis of RF signals.
   a) Spectrum b) Logic
   c) FFT d) Vector

P.T.O.

6) Smart sensor can be designed using _____
   a) ASIC b) SOC
   c) Both a) and b) d) None of these

7) 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

8) _____ analyzers are useful when looking at time relationships or data on a bus.
   a) Spectrum b) Logic c) Wave d) Data

9) Which of below is not a block of universal counter ?
   a) Schmitt trigger b) Decade counter
   c) Pulse width converter d) Crystal oscillator

10) LCD contains
   a) NLC fluid b) Epoxy fluid
   c) Nixie tube d) All of these

_____

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Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
ELECTRONIC INSTRUMENTATION
Self Learning

Day and Date : Monday, 27-11-2017 Marks : 40
Time : 10.00 a.m. to 12.00 noon

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) With suitable diagram explain DC signal conditioning system.
   b) Explain dynamic characteristics of an instrument.

3. Solve **any three** : **(3×4=12)**
   a) The expected value of the voltage across resistor is 80V. However the measurement gives a value of 79V. Calculate – absolute error, % error, relative accuracy, % of accuracy.
   b) With suitable diagram explain LED display.
   c) What are different types of standards ?
   d) Define the terms – accuracy, error, precision and resolution.

SECTION – II

4. Solve **any one** : **(1×8=8)**
   a) Draw and explain FFT analyzer.
   b) Draw and explain DAS.

5. Solve **any three** : **(3×4=12)**
   a) Explain any two features of smart sensor.
   b) With suitable diagram explain strip chart recorder.
   c) With suitable diagram explain ultrasonic sensor.
   d) Explain any four applications of spectrum analyzer.

Set R

Set R

SLR-TJ – 168

Seat No.	

Set S

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
ELECTRONIC INSTRUMENTATION
Self Learning

Day and Date : Monday, 27-11-2017 Max. Marks : 50

Time : 10.00 a.m. to 12.00 noon

***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 15 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 : 15 Minutes Marks : 10

1. Select suitable option : **(10×1=10)**

1) _____ analyzers are used for FFT analysis of RF signals.

a) Spectrum b) Logic

c) FFT d) Vector

2) Smart sensor can be designed using _____

a) ASIC b) SOC

c) Both a) and b) d) None of these

3) _____ is an example of smart sensor.

a) Universal counter b) Spectrum analyzer

c) CCD imaging d) All of these

4) Digital panel meter is an example of

a) DAS b) ADC

c) Data logger d) None of these

P.T.O.

5) Which of below is not a block of universal counter ?
   a) Schmitt trigger b) Decade counter
   c) Pulse width converter d) Crystal oscillator

6) LCD contains
   a) NLC fluid b) Epoxy fluid
   c) Nixie tube d) All of these

7) Mercury in glass thermometer is an example of _____ order instrument.
   a) Zero b) First
   c) Second d) None of these

8) Which of below is not a type of standard ?
   a) Primary b) Secondary
   c) Working d) None of these

9) 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

10) _____ analyzers are useful when looking at time relationships or data on a bus.
   a) Spectrum b) Logic c) Wave d) Data

_____

SLR-TJ – 168

Seat No.	

T.E. (Electronics Engineering) (Part – II) (CGPA) Examination, 2017
ELECTRONIC INSTRUMENTATION
Self Learning

Day and Date : Monday, 27-11-2017 Marks : 40
Time : 10.00 a.m. to 12.00 noon

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) With suitable diagram explain DC signal conditioning system.
   b) Explain dynamic characteristics of an instrument.

3. Solve **any three** : **(3×4=12)**
   a) The expected value of the voltage across resistor is 80V. However the measurement gives a value of 79V. Calculate – absolute error, % error, relative accuracy, % of accuracy.
   b) With suitable diagram explain LED display.
   c) What are different types of standards ?
   d) Define the terms – accuracy, error, precision and resolution.

SECTION – II

4. Solve **any one** : **(1×8=8)**
   a) Draw and explain FFT analyzer.
   b) Draw and explain DAS.

5. Solve **any three** : **(3×4=12)**
   a) Explain any two features of smart sensor.
   b) With suitable diagram explain strip chart recorder.
   c) With suitable diagram explain ultrasonic sensor.
   d) Explain any four applications of spectrum analyzer.

Set S

Set S

SLR-TJ – 169

Seat No.	

Set P

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
PROGRAMMING IN VISUAL BASIC .NET
Technical Self Learning Module – II

Day and Date : Monday, 27-11-2017 Max. Marks : 50
Time : 10.00 a.m. to 12.00 noon

***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) A _____ performs invisible tasks even if you write no code.
   A) Destructor B) Private Method
   C) Constructor D) Function

2) The _____ model does not offer a model for source code reuse.
   A) COM+ B) DCOM
   C) COM D) .Net

3) _____ allow custom items of information about a program element to be stored with an assembly's metadata.
   A) Properties B) Attributes
   C) Methods D) Classes

4) The corresponding .Net FCL type for short is
   A) System.Int32 B) System.Int64
   C) System.Int16 D) System.Object

5) The member “Clear” of the Array class that sets a range of array elements to zero, false or null reference is a _____ method.

A) Shared B) Method

C) Class D) Object

6) The _____ method converts an OLE automation date value to a Date Time Insurance.

A) Today B) TimeOfDay

C) Now D) FromOADate

7) The function procedures are _____ by default.

A) Public B) Private

C) Protected D) Inherited

8) Every optional argument in the procedure definition must specify a _____ value which must be a constant expression.

A) Constant B) Default

C) Integer D) Character

9) Type casting in VB.Net is implemented by means of _____ statement.

A) Type() B) TypeDef()

C) Btype() D) Ctype()

10) State whether the statement true or false.

i. Function procedures are public by default.

ii. Function procedure return values whereas sub procedures cannot return a value to the calling procedure.

A) True, True B) True, False

C) False, True D) False, False

_____

SLR-TJ – 169

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
PROGRAMMING IN VISUAL BASIC .NET
Technical Self Learning Module – II

Day and Date : Monday, 27-11-2017 Marks : 40
Time : 10.00 a.m. to 12.00 noon

Instructions *: 1) Attempt* ***all*** *the questions.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

2. Explain string functions with a program. **10**

3. Explain OPTION STRICT statement and Namespace with example. **10**

OR

4. Explain user defined data types. Write a program to demonstrate user defined data types. **10**

5. Attempt **any four** questions. **20**

a) Explain select case with example.

b) Explain Parameterized function with example.

c) Define exception. Explain on structured exception.

d) Write a note on user defined functions.

e) Explain MSIL.

———————

Set P

SLR-TJ – 169

Seat No.	

Set **Q**

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
PROGRAMMING IN VISUAL BASIC .NET
Technical Self Learning Module – II

Day and Date : Monday, 27-11-2017 Max. Marks : 50
Time : 10.00 a.m. to 12.00 noon

***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) Type casting in VB.Net is implemented by means of _____ statement.

A) Type() B) TypeDef()

C) Btype() D) Ctype()

2) State whether the statement true or false.

i. Function procedures are public by default.

ii. Function procedure return values whereas sub procedures cannot return a value to the calling procedure.

A) True, True B) True, False

C) False, True D) False, False

3) The function procedures are _____ by default.

A) Public B) Private

C) Protected D) Inherited

P.T.O.

4) Every optional argument in the procedure definition must specify a _____ value which must be a constant expression.
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   C) Integer D) Character

5) A _____ performs invisible tasks even if you write no code.
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   C) Constructor D) Function

6) The _____ model does not offer a model for source code reuse.
   A) COM+ B) DCOM
   C) COM D) .Net

7) _____ allow custom items of information about a program element to be stored with an assembly's metadata.
   A) Properties B) Attributes
   C) Methods D) Classes

8) The corresponding .Net FCL type for short is
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   C) System.Int16 D) System.Object

9) The member "Clear" of the Array class that sets a range of array elements to zero, false or null reference is a _____ method.
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   C) Class D) Object

10) The _____ method converts an OLE automation date value to a Date Time Insurance.
   A) Today B) TimeOfDay
   C) Now D) FromOADate

_____

SLR-TJ – 169

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
PROGRAMMING IN VISUAL BASIC .NET
Technical Self Learning Module – II

Day and Date : Monday, 27-11-2017 Marks : 40
Time : 10.00 a.m. to 12.00 noon

Instructions *: 1) Attempt* ***all*** *the questions.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

2. Explain string functions with a program. **10**

3. Explain OPTION STRICT statement and Namespace with example. **10**

OR

4. Explain user defined data types. Write a program to demonstrate user defined data types. **10**

5. Attempt **any four** questions. **20**

a) Explain select case with example.

b) Explain Parameterized function with example.

c) Define exception. Explain on structured exception.

d) Write a note on user defined functions.

e) Explain MSIL.

———————

Set Q

SLR-TJ – 169

Seat No.	

Set **R**

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
PROGRAMMING IN VISUAL BASIC .NET
Technical Self Learning Module – II

Day and Date : Monday, 27-11-2017 Max. Marks : 50
Time : 10.00 a.m. to 12.00 noon

***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 member "Clear" of the Array class that sets a range of array elements to zero, false or null reference is a _____ method.

A) Shared B) Method
C) Class D) Object

2) The _____ method converts an OLE automation date value to a Date Time Insurance.

A) Today B) TimeOfDay
C) Now D) FromOADate

3) Type casting in VB.Net is implemented by means of _____ statement.

A) Type() B) TypeDef()
C) Btype() D) Ctype()

4) State whether the statement true or false.
   i. Function procedures are public by default.
   ii. Function procedure return values whereas sub procedures cannot return a value to the calling procedure.

   A) True, True B) True, False
   C) False, True D) False, False

5) _____ allow custom items of information about a program element to be stored with an assembly's metadata.
   A) Properties B) Attributes
   C) Methods D) Classes

6) The corresponding .Net FCL type for short is
   A) System.Int32 B) System.Int64
   C) System.Int16 D) System.Object

7) A _____ performs invisible tasks even if you write no code.
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   C) Constructor D) Function

8) The _____ model does not offer a model for source code reuse.
   A) COM+ B) DCOM
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9) The function procedures are _____ by default.
   A) Public B) Private
   C) Protected D) Inherited

10) Every optional argument in the procedure definition must specify a _____ value which must be a constant expression.
   A) Constant B) Default
   C) Integer D) Character

_____

SLR-TJ – 169

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
PROGRAMMING IN VISUAL BASIC .NET
Technical Self Learning Module – II

Day and Date : Monday, 27-11-2017 Marks : 40
Time : 10.00 a.m. to 12.00 noon

Instructions *: 1) Attempt* ***all*** *the questions.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

2. Explain string functions with a program. **10**

3. Explain OPTION STRICT statement and Namespace with example. **10**

OR

4. Explain user defined data types. Write a program to demonstrate user defined data types. **10**

5. Attempt **any four** questions. **20**

a) Explain select case with example.

b) Explain Parameterized function with example.

c) Define exception. Explain on structured exception.

d) Write a note on user defined functions.

e) Explain MSIL.

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Set R

SLR-TJ – 169

Seat No.	

Set **S**

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
PROGRAMMING IN VISUAL BASIC .NET
Technical Self Learning Module – II

Day and Date : Monday, 27-11-2017 Max. Marks : 50
Time : 10.00 a.m. to 12.00 noon

***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) _____ allow custom items of information about a program element to be stored with an assembly's metadata.
   A) Properties B) Attributes
   C) Methods D) Classes

2) The corresponding .Net FCL type for short is
   A) System.Int32 B) System.Int64
   C) System.Int16 D) System.Object

3) The member "Clear" of the Array class that sets a range of array elements to zero, false or null reference is a _____ method.
   A) Shared B) Method
   C) Class D) Object

4) The _____ method converts an OLE automation date value to a Date Time Insurance.
   A) Today B) TimeOfDay
   C) Now D) FromOADate

P.T.O.

5) The function procedures are _____ by default.
   A) Public B) Private
   C) Protected D) Inherited

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   C) Integer D) Character

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   A) Type() B) TypeDef()
   C) Btype() D) Ctype()

8) State whether the statement true or false.
   i. Function procedures are public by default.
   ii. Function procedure return values whereas sub procedures cannot return a value to the calling procedure.
   A) True, True B) True, False
   C) False, True D) False, False

9) A _____ performs invisible tasks even if you write no code.
   A) Destructor B) Private Method
   C) Constructor D) Function

10) The _____ model does not offer a model for source code reuse.
   A) COM+ B) DCOM
   C) COM D) .Net

_____

SLR-TJ – 169

Seat No.	

T.E. (Electronics) (Part – II) (CGPA) Examination, 2017
PROGRAMMING IN VISUAL BASIC .NET
Technical Self Learning Module – II

Day and Date : Monday, 27-11-2017 Marks : 40
Time : 10.00 a.m. to 12.00 noon

Instructions *: 1) Attempt* ***all*** *the questions.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

2. Explain string functions with a program. **10**

3. Explain OPTION STRICT statement and Namespace with example. **10**

OR

4. Explain user defined data types. Write a program to demonstrate user defined data types. **10**

5. Attempt **any four** questions. **20**

a) Explain select case with example.

b) Explain Parameterized function with example.

c) Define exception. Explain on structured exception.

d) Write a note on user defined functions.

e) Explain MSIL.

———————

Set S

SLR-TJ – 170

Seat No.	

Set P

B.E. (Electronics) (Part – I) (New) (CGPA) Examination, 2017
POWER ELECTRONICS

Day and Date : Tuesday, 28-11-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer.

1) In a three-phase full controlled rectifier, if the input frequency is 50 Hz, then output ripple frequency will be
   a) 150 Hz b) 300 Hz c) 100 Hz d) 200 Hz

2) A converter which can operate as 3-pulse converter is a
   a) Three phase half wave b) Three phase full converter
   c) Three phase series converter d) Three phase dual converter

3) In three phase semi converter PIV across any thyristor is
   a) $\sqrt{2}\ V_m$ b) $\sqrt{3}\ V_m$ c) V_m d) $\sqrt{3}\ V_{LL}$

4) The average value of the output voltage in a step-down dc chopper is given by
   a) $V_o = V_s$ b) $V_o = KV_s$
   c) $V_o = V_s/K$ d) $V_o = V_s/(1 - K)$

5) In class A and class B commutation the resonating circuit has to be
   a) Over damped b) Critically damped
   c) Under damped d) Negatively damped

6) How many switches are used to construct three phase to single phase cycloconverter ?
   a) 6 SCR's b) 12 SCR's c) 36 SCR's d) 18 SCR's

7) A cycloconverter is a
   a) one stage power converter
   b) one stage voltage converter
   c) one stage frequency converter
   d) none of the mentioned

8) In single phase voltage source inverter, which harmonic is not present ?
   a) 2^{nd} b) 3^{rd} c) 5^{th} d) 7^{th}

9) A three phase semiconverter drives a DC motor. The system is capable of
   a) Motoring and braking in both directions
   b) Only motoring in both directions, no braking
   c) Motoring in forward direction and braking in reverse direction
   d) Only motoring in forward direction, no braking

10) In three phase 180° conduction mode
   a) At any instant of time three thyristors are ON
   b) Odd harmonics are absent
   c) No possibility of short circuit
   d) All of the above

11) Speed control of DC motor can be obtained from
   a) Armature voltage control method
   b) Flux control method
   c) Both a and b
   d) Neither a nor b

12) In a circuit high reactive power compared to true power indicates
   a) Low power factor
   b) High power factor
   c) Low efficiency
   d) High efficiency

13) In order to improve the power factor of equipment operating at lagging power factor, a capacitor is connected
   a) In series with the equipment
   b) In parallel with the equipment
   c) In series-parallel with the equipment
   d) None of these

14) In Multiple Pulse Width Modulation technique frequency of output is depends on
   a) frequency of reference signal
   b) frequency of carrier signal
   c) frequency of reference and carrier
   d) load

SLR-TJ – 170

Seat No.	

B.E. (Electronics) (Part – I) (New) (CGPA) Examination, 2017
POWER ELECTRONICS

Day and Date : Tuesday, 28-11-2017 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. Solve **any four** : **(4×4=16)**

a) A three phase controlled fully controlled rectifier is operated from 208V, 3φ, 60 Hz mains. The load resistor of 10Ω. If it is required to obtain an average output voltage of 60% of the maximum possible voltage. Estimate average output voltage and average current of converter, delay angle and PIV of SCRs.

b) Explain working of Class D chopper with suitable circuit diagram.

c) Explain working of step down chopper and derive an expression for output voltage, duty cycle and effective input resistance.

d) Explain operation of single phase midpoint cycloconverter with resistive load. The frequency is f_o/f_s = 1/5. Sketch associated waveforms.

e) Describe the control circuit block diagram for three phase cycloconverter.

3. Solve **any two** : **(2×6=12)**

1) Design microcontroller based firing scheme for three phase controlled converters.

2) Explain working of voltage commutated chopper with associated voltage and current waveform as a function of time.

3) Derive an expression for V_{dc} and V_{rms} of three phase semiconverter with resistive load for continuous conduction mode. Draw neat waveform for $\alpha = 30^\circ$.

SECTION – II

4. Solve **any four** : **(4×4=16)**
   1) Explain working of three phase cycloconverter drive with suitable diagram.
   2) Explain operation of single phase full bridge voltage source inverter with inductive load. Draw associate waveforms.
   3) Explain how lower order harmonics are reduced using PWM techniques.
   4) Differentiate between series inverter and parallel inverter.
   5) Why it is essential to maintain power factor ? Explain any one methods for improvement of power factor.

5. Solve **any two** : **(2×6=12)**
   1) Explain working of 180° conduction mode, three phase bridge inverter feeding star connected purely resistive load. Draw associated line and phase voltage waveforms.
   2) Explain the working of speed control of DC drive using fuzzy logic controller with suitable block diagram.
   3) With suitable circuit diagram and appropriate waveforms explain working of basic parallel inverter.

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SLR-TJ – 170

Seat No.	

Set Q

B.E. (Electronics) (Part – I) (New) (CGPA) Examination, 2017
POWER ELECTRONICS

Day and Date : Tuesday, 28-11-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer.

1) In single phase voltage source inverter, which harmonic is not present ?
   a) 2^{nd} b) 3^{rd} c) 5^{th} d) 7^{th}

2) A three phase semiconverter drives a DC motor. The system is capable of
   a) Motoring and braking in both directions
   b) Only motoring in both directions, no braking
   c) Motoring in forward direction and braking in reverse direction
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3) In three phase 180° conduction mode
   a) At any instant of time three thyristors are ON
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   a) Armature voltage control method b) Flux control method
   c) Both a and b d) Neither a nor b

5) In a circuit high reactive power compared to true power indicates
   a) Low power factor b) High power factor
   c) Low efficiency d) High efficiency

6) In order to improve the power factor of equipment operating at lagging power factor, a capacitor is connected
   a) In series with the equipment
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7) In Multiple Pulse Width Modulation technique frequency of output is depends on
   a) frequency of reference signal b) frequency of carrier signal
   c) frequency of reference and carrier d) load

8) In a three-phase full controlled rectifier, if the input frequency is 50 Hz, then output ripple frequency will be
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11) The average value of the output voltage in a step-down dc chopper is given by
   a) $V_o = V_s$ b) $V_o = KV_s$
   c) $V_o = V_s/K$ d) $V_o = V_s/(1 - K)$

12) In class A and class B commutation the resonating circuit has to be
   a) Over damped b) Critically damped
   c) Under damped d) Negatively damped

13) How many switches are used to construct three phase to single phase cycloconverter ?
   a) 6 SCR's b) 12 SCR's c) 36 SCR's d) 18 SCR's

14) A cycloconverter is a
   a) one stage power converter b) one stage voltage converter
   c) one stage frequency converter d) none of the mentioned

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SLR-TJ – 170

Seat No.	

B.E. (Electronics) (Part – I) (New) (CGPA) Examination, 2017
POWER ELECTRONICS

Day and Date : Tuesday, 28-11-2017 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. Solve **any four** : **(4×4=16)**

a) A three phase controlled fully controlled rectifier is operated from 208V, 3φ, 60 Hz mains. The load resistor of 10Ω. If it is required to obtain an average output voltage of 60% of the maximum possible voltage. Estimate average output voltage and average current of converter, delay angle and PIV of SCRs.

b) Explain working of Class D chopper with suitable circuit diagram.

c) Explain working of step down chopper and derive an expression for output voltage, duty cycle and effective input resistance.

d) Explain operation of single phase midpoint cycloconverter with resistive load. The frequency is f_o/f_s = 1/5. Sketch associated waveforms.

e) Describe the control circuit block diagram for three phase cycloconverter.

3. Solve **any two** : **(2×6=12)**

1) Design microcontroller based firing scheme for three phase controlled converters.

2) Explain working of voltage commutated chopper with associated voltage and current waveform as a function of time.

3) Derive an expression for V_{dc} and V_{rms} of three phase semiconverter with resistive load for continuous conduction mode. Draw neat waveform for $\alpha = 30^\circ$.

SECTION – II

4. Solve **any four** : **(4×4=16)**
   1) Explain working of three phase cycloconverter drive with suitable diagram.
   2) Explain operation of single phase full bridge voltage source inverter with inductive load. Draw associate waveforms.
   3) Explain how lower order harmonics are reduced using PWM techniques.
   4) Differentiate between series inverter and parallel inverter.
   5) Why it is essential to maintain power factor ? Explain any one methods for improvement of power factor.

5. Solve **any two** : **(2×6=12)**
   1) Explain working of 180° conduction mode, three phase bridge inverter feeding star connected purely resistive load. Draw associated line and phase voltage waveforms.
   2) Explain the working of speed control of DC drive using fuzzy logic controller with suitable block diagram.
   3) With suitable circuit diagram and appropriate waveforms explain working of basic parallel inverter.

———————

SLR-TJ – 170

Seat No.	

Set R

B.E. (Electronics) (Part – I) (New) (CGPA) Examination, 2017
POWER ELECTRONICS

Day and Date : Tuesday, 28-11-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer.

1) In class A and class B commutation the resonating circuit has to be
   a) Over damped b) Critically damped
   c) Under damped d) Negatively damped

2) How many switches are used to construct three phase to single phase cycloconverter ?
   a) 6 SCR's b) 12 SCR's c) 36 SCR's d) 18 SCR's

3) A cycloconverter is a
   a) one stage power converter b) one stage voltage converter
   c) one stage frequency converter d) none of the mentioned

4) In single phase voltage source inverter, which harmonic is not present ?
   a) 2^{nd} b) 3^{rd} c) 5^{th} d) 7^{th}

5) A three phase semiconverter drives a DC motor. The system is capable of
   a) Motoring and braking in both directions
   b) Only motoring in both directions, no braking
   c) Motoring in forward direction and braking in reverse direction
   d) Only motoring in forward direction, no braking

6) In three phase 180° conduction mode
   a) At any instant of time three thyristors are ON
   b) Odd harmonics are absent
   c) No possibility of short circuit
   d) All of the above

7) Speed control of DC motor can be obtained from
   a) Armature voltage control method b) Flux control method
   c) Both a and b d) Neither a nor b

8) In a circuit high reactive power compared to true power indicates
   a) Low power factor b) High power factor
   c) Low efficiency d) High efficiency

9) In order to improve the power factor of equipment operating at lagging power factor, a capacitor is connected
   a) In series with the equipment
   b) In parallel with the equipment
   c) In series-parallel with the equipment
   d) None of these

10) In Multiple Pulse Width Modulation technique frequency of output is depends on
   a) frequency of reference signal b) frequency of carrier signal
   c) frequency of reference and carrier d) load

11) In a three-phase full controlled rectifier, if the input frequency is 50 Hz, then output ripple frequency will be
   a) 150 Hz b) 300 Hz c) 100 Hz d) 200 Hz

12) A converter which can operate as 3-pulse converter is a
   a) Three phase half wave b) Three phase full converter
   c) Three phase series converter d) Three phase dual converter

13) In three phase semi converter PIV across any thyristor is
   a) $\sqrt{2}\ V_m$ b) $\sqrt{3}\ V_m$ c) V_m d) $\sqrt{3}\ V_{LL}$

14) The average value of the output voltage in a step-down dc chopper is given by
   a) $V_o = V_s$ b) $V_o = KV_s$
   c) $V_o = V_s/K$ d) $V_o = V_s/(1 - K)$

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SLR-TJ – 170

Seat No.	

B.E. (Electronics) (Part – I) (New) (CGPA) Examination, 2017
POWER ELECTRONICS

Day and Date : Tuesday, 28-11-2017 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. Solve **any four** : **(4×4=16)**

a) A three phase controlled fully controlled rectifier is operated from 208V, 3φ, 60 Hz mains. The load resistor of 10Ω. If it is required to obtain an average output voltage of 60% of the maximum possible voltage. Estimate average output voltage and average current of converter, delay angle and PIV of SCRs.

b) Explain working of Class D chopper with suitable circuit diagram.

c) Explain working of step down chopper and derive an expression for output voltage, duty cycle and effective input resistance.

d) Explain operation of single phase midpoint cycloconverter with resistive load. The frequency is f_o/f_s = 1/5. Sketch associated waveforms.

e) Describe the control circuit block diagram for three phase cycloconverter.

3. Solve **any two** : **(2×6=12)**

1) Design microcontroller based firing scheme for three phase controlled converters.

2) Explain working of voltage commutated chopper with associated voltage and current waveform as a function of time.

3) Derive an expression for V_{dc} and V_{rms} of three phase semiconverter with resistive load for continuous conduction mode. Draw neat waveform for $\alpha = 30^\circ$.

SECTION – II

4. Solve **any four** : **(4×4=16)**
   1) Explain working of three phase cycloconverter drive with suitable diagram.
   2) Explain operation of single phase full bridge voltage source inverter with inductive load. Draw associate waveforms.
   3) Explain how lower order harmonics are reduced using PWM techniques.
   4) Differentiate between series inverter and parallel inverter.
   5) Why it is essential to maintain power factor ? Explain any one methods for improvement of power factor.

5. Solve **any two** : **(2×6=12)**
   1) Explain working of 180° conduction mode, three phase bridge inverter feeding star connected purely resistive load. Draw associated line and phase voltage waveforms.
   2) Explain the working of speed control of DC drive using fuzzy logic controller with suitable block diagram.
   3) With suitable circuit diagram and appropriate waveforms explain working of basic parallel inverter.

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SLR-TJ – 170

Seat No.	

Set S

B.E. (Electronics) (Part – I) (New) (CGPA) Examination, 2017
POWER ELECTRONICS

Day and Date : Tuesday, 28-11-2017 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct answer.

1) In three phase 180° conduction mode
   a) At any instant of time three thyristors are ON
   b) Odd harmonics are absent
   c) No possibility of short circuit
   d) All of the above

2) Speed control of DC motor can be obtained from
   a) Armature voltage control method b) Flux control method
   c) Both a and b d) Neither a nor b

3) In a circuit high reactive power compared to true power indicates
   a) Low power factor b) High power factor
   c) Low efficiency d) High efficiency

4) In order to improve the power factor of equipment operating at lagging power factor, a capacitor is connected
   a) In series with the equipment
   b) In parallel with the equipment
   c) In series-parallel with the equipment
   d) None of these

5) In Multiple Pulse Width Modulation technique frequency of output is depends on
   a) frequency of reference signal
   b) frequency of carrier signal
   c) frequency of reference and carrier
   d) load

6) In a three-phase full controlled rectifier, if the input frequency is 50 Hz, then output ripple frequency will be
   a) 150 Hz b) 300 Hz c) 100 Hz d) 200 Hz

7) A converter which can operate as 3-pulse converter is a
   a) Three phase half wave
   b) Three phase full converter
   c) Three phase series converter
   d) Three phase dual converter

8) In three phase semi converter PIV across any thyristor is
   a) $\sqrt{2}\ V_m$ b) $\sqrt{3}\ V_m$ c) V_m d) $\sqrt{3}\ V_{LL}$

9) The average value of the output voltage in a step-down dc chopper is given by
   a) $V_o = V_s$
   b) $V_o = KV_s$
   c) $V_o = V_s/K$
   d) $V_o = V_s/(1 - K)$

10) In class A and class B commutation the resonating circuit has to be
   a) Over damped
   b) Critically damped
   c) Under damped
   d) Negatively damped

11) How many switches are used to construct three phase to single phase cycloconverter ?
   a) 6 SCR's b) 12 SCR's c) 36 SCR's d) 18 SCR's

12) A cycloconverter is a
   a) one stage power converter
   b) one stage voltage converter
   c) one stage frequency converter
   d) none of the mentioned

13) In single phase voltage source inverter, which harmonic is not present ?
   a) 2^{nd} b) 3^{rd} c) 5^{th} d) 7^{th}

14) A three phase semiconverter drives a DC motor. The system is capable of
   a) Motoring and braking in both directions
   b) Only motoring in both directions, no braking
   c) Motoring in forward direction and braking in reverse direction
   d) Only motoring in forward direction, no braking

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SLR-TJ – 170

Seat No.	

B.E. (Electronics) (Part – I) (New) (CGPA) Examination, 2017
POWER ELECTRONICS

Day and Date : Tuesday, 28-11-2017 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. Solve **any four** : **(4×4=16)**

a) A three phase controlled fully controlled rectifier is operated from 208V, 3φ, 60 Hz mains. The load resistor of 10Ω. If it is required to obtain an average output voltage of 60% of the maximum possible voltage. Estimate average output voltage and average current of converter, delay angle and PIV of SCRs.

b) Explain working of Class D chopper with suitable circuit diagram.

c) Explain working of step down chopper and derive an expression for output voltage, duty cycle and effective input resistance.

d) Explain operation of single phase midpoint cycloconverter with resistive load. The frequency is f_o/f_s = 1/5. Sketch associated waveforms.

e) Describe the control circuit block diagram for three phase cycloconverter.

3. Solve **any two** : **(2×6=12)**

1) Design microcontroller based firing scheme for three phase controlled converters.

2) Explain working of voltage commutated chopper with associated voltage and current waveform as a function of time.

3) Derive an expression for V_{dc} and V_{rms} of three phase semiconverter with resistive load for continuous conduction mode. Draw neat waveform for $\alpha = 30^\circ$.

SECTION – II

4. Solve **any four** : **(4×4=16)**
   1) Explain working of three phase cycloconverter drive with suitable diagram.
   2) Explain operation of single phase full bridge voltage source inverter with inductive load. Draw associate waveforms.
   3) Explain how lower order harmonics are reduced using PWM techniques.
   4) Differentiate between series inverter and parallel inverter.
   5) Why it is essential to maintain power factor ? Explain any one methods for improvement of power factor.

5. Solve **any two** : **(2×6=12)**
   1) Explain working of 180° conduction mode, three phase bridge inverter feeding star connected purely resistive load. Draw associated line and phase voltage waveforms.
   2) Explain the working of speed control of DC drive using fuzzy logic controller with suitable block diagram.
   3) With suitable circuit diagram and appropriate waveforms explain working of basic parallel inverter.

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SLR-TJ – 171

Seat No.	

Set **P**

B.E. (Electronics Engineering) (Part – I) (New CGPA) Examination, 2017
COMPUTER NETWORK

Day and Date : Thursday, 30-11-2017 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) Figures to the **right** indicate **full** marks.*
*4) Assume suitable data if **necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) In the _____ method, after the station finds the line idle, it sends its frame immediately. If the line is not idle, it continuously senses the line until it finds it idle.
   a) 1 – persistent b) non persistent
   c) p – persistent d) none of the above

2) In _____ topology, if a computer's network cable is broken, whole network goes down.
   a) Bus b) Star
   c) Mesh d) All above

3) Which frame in HDLC doesn't carry sequence in its format ?
   a) I – Frame b) U – Frame
   c) S – Frame d) None of the above

4) In cyclic redundancy what is CRC ?
   a) Divisor b) Dividend
   c) Quotient d) Reminder

P.T.O.

5) In bit stuffing, the length of the original data
   a) Remains same b) Increases
   c) Decreases d) Increases exponentially

6) The minimum frame size for 10 Mbps LAN is _____ bytes.
   a) 64 b) 640 c) 1500 d) 6400

7) LAN 802.4 is _____ standard.
   a) Analog b) Digital
   c) Both analog and digital d) None of given

8) ARP is used to find _____ address of a host.
   a) Physical address b) IP address
   c) Port address d) Computer

9) Router is layer _____ device.
   a) Three b) Two c) One d) All

10) TCP uses _____ protocol for flow control.
   a) UDP b) IP
   c) Sliding window d) Stop_and_wait

11) Shortest path routing algorithm is an example of _____ routing protocol.
   a) Static b) Dynamic
   c) Flexible d) None of the above

12) UDP packets have a fixed-size header of _____ bytes.
   a) 8 b) 16
   c) 40 d) None of the above

13) 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

14) Which statement for TCP is false ?
   a) Connection oriented transfer b) Reliable
   c) Don't provide feedback d) Point to point communication

_____

SLR-TJ – 171

Seat No.	

B.E. (Electronics Engineering) (Part – I) (New CGPA) Examination, 2017
COMPUTER NETWORK

Day and Date : Thursday, 30-11-2017 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 if ***necessary****.*

SECTION – I

2. Answer **any four** : **(4×4=16)**

1) Define Shannon's theorem to find channel capacity ? Find maximum data rate for a telephone network with BW = 3 KHz and SNR = 20.
2) What is Hamming distance ? Find Hamming codeword for a character F = 1000110. Assume even parity. What is the limitation of Hamming code method ?
3) Discuss Go_Back_N ARQ and selective repeat ARQ related to sliding window flow control method.
4) Explain various CSMA method in detail. Whose performance is better amongst all ?
5) What is static and dynamic channel allocation ? What is drawback of static channel allocation ? Specify various assumptions made in dynamic channel allocation.

3. Answer **any two** : **(2×6=12)**

1) Explain Stop_and _Wait flow control mechanism in short and derive expression for its link utilization efficiency.

   A channel operating at 4800 bps has propagation delay of 20 ms, what should be the minimum frame size for Stop_and _Wait flow control to get 60% link utilization efficiency ?
2) What are types of stations, modes of data transfer in HDLC ? Draw frame format for information exchange in HDLC. Discuss control fields of I, S and U frame in HDLC.
3) List various network devices used in networking.

   What is token ? Draw frame format for IEEE 802.5 LAN standard and explain in detail. How frame acknowledgement is achieved in this LAN standard ?

SECTION – II

4. Answer **any four** : **(4×4=16)**

1) What is host and net id in case of IP address ? What is mask and subnetting related to IP ? What are the classes of given IP addresses ?
   i) 4.23.145.90
   ii) 129.6.8.4

2) What encapsulation and decapsulation in TCP/IP ? Discuss three way handshake in TCP.

3) What is the role of ICMP ? Specify different ICMP messages and their meanings.

4) Draw header format of ARP packet and explain each field in detail.

5) Discuss software defined networking .

5. Answer **any two** : **(2×6=12)**

1) What is difference between host to host and process to process communication ? Draw IP header format and explain neatly.

2) What is principle of optimality and fairness in routing ? Discuss flow based routing algorithm in detail.

3) Draw UDP packet format and explain its header. Compare between TCP and UDP.

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SLR-TJ – 171

Seat No.	

Set **Q**

B.E. (Electronics Engineering) (Part – I) (New CGPA) Examination, 2017
COMPUTER NETWORK

Day and Date : Thursday, 30-11-2017 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) Figures to the **right** indicate **full** marks.*
*4) Assume suitable data if **necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) ARP is used to find _____ address of a host.
   a) Physical address b) IP address
   c) Port address d) Computer

2) Router is layer _____ device.
   a) Three b) Two c) One d) All

3) TCP uses _____ protocol for flow control.
   a) UDP b) IP
   c) Sliding window d) Stop_and_wait

4) Shortest path routing algorithm is an example of _____ routing protocol.
   a) Static b) Dynamic
   c) Flexible d) None of the above

5) UDP packets have a fixed-size header of _____ bytes.
   a) 8 b) 16
   c) 40 d) None of the above

P.T.O.

6) 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

7) Which statement for TCP is false ?
   a) Connection oriented transfer b) Reliable
   c) Don't provide feedback d) Point to point communication

8) In the _____ method, after the station finds the line idle, it sends its frame immediately. If the line is not idle, it continuously senses the line until it finds it idle.
   a) 1 – persistent b) non persistent
   c) p – persistent d) none of the above

9) In _____ topology, if a computer's network cable is broken, whole network goes down.
   a) Bus b) Star
   c) Mesh d) All above

10) Which frame in HDLC doesn't carry sequence in its format ?
   a) I – Frame b) U – Frame
   c) S – Frame d) None of the above

11) In cyclic redundancy what is CRC ?
   a) Divisor b) Dividend
   c) Quotient d) Reminder

12) In bit stuffing, the length of the original data
   a) Remains same b) Increases
   c) Decreases d) Increases exponentially

13) The minimum frame size for 10 Mbps LAN is _____ bytes.
   a) 64 b) 640 c) 1500 d) 6400

14) LAN 802.4 is _____ standard.
   a) Analog b) Digital
   c) Both analog and digital d) None of given

_____

SLR-TJ – 171

Seat No.	

B.E. (Electronics Engineering) (Part – I) (New CGPA) Examination, 2017
COMPUTER NETWORK

Day and Date : Thursday, 30-11-2017 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 if ***necessary****.*

SECTION – I

2. Answer **any four** : **(4×4=16)**

1) Define Shannon's theorem to find channel capacity ? Find maximum data rate for a telephone network with BW = 3 KHz and SNR = 20.
2) What is Hamming distance ? Find Hamming codeword for a character F = 1000110. Assume even parity. What is the limitation of Hamming code method ?
3) Discuss Go_Back_N ARQ and selective repeat ARQ related to sliding window flow control method.
4) Explain various CSMA method in detail. Whose performance is better amongst all ?
5) What is static and dynamic channel allocation ? What is drawback of static channel allocation ? Specify various assumptions made in dynamic channel allocation.

3. Answer **any two** : **(2×6=12)**

1) Explain Stop_and _Wait flow control mechanism in short and derive expression for its link utilization efficiency.

   A channel operating at 4800 bps has propagation delay of 20 ms, what should be the minimum frame size for Stop_and _Wait flow control to get 60% link utilization efficiency ?
2) What are types of stations, modes of data transfer in HDLC ? Draw frame format for information exchange in HDLC. Discuss control fields of I, S and U frame in HDLC.
3) List various network devices used in networking.

   What is token ? Draw frame format for IEEE 802.5 LAN standard and explain in detail. How frame acknowledgement is achieved in this LAN standard ?

SECTION – II

4. Answer **any four** : **(4×4=16)**

   1) What is host and net id in case of IP address ? What is mask and subnetting related to IP ? What are the classes of given IP addresses ?
      i) 4.23.145.90
      ii) 129.6.8.4

   2) What encapsulation and decapsulation in TCP/IP ? Discuss three way handshake in TCP.

   3) What is the role of ICMP ? Specify different ICMP messages and their meanings.

   4) Draw header format of ARP packet and explain each field in detail.

   5) Discuss software defined networking .

5. Answer **any two** : **(2×6=12)**

   1) What is difference between host to host and process to process communication ? Draw IP header format and explain neatly.

   2) What is principle of optimality and fairness in routing ? Discuss flow based routing algorithm in detail.

   3) Draw UDP packet format and explain its header. Compare between TCP and UDP.

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SLR-TJ – 171

Seat No.	

Set R

B.E. (Electronics Engineering) (Part – I) (New CGPA) Examination, 2017
COMPUTER NETWORK

Day and Date : Thursday, 30-11-2017 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) Figures to the **right** indicate **full** marks.*
*4) Assume suitable data if **necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) In bit stuffing, the length of the original data
   a) Remains same b) Increases
   c) Decreases d) Increases exponentially

2) The minimum frame size for 10 Mbps LAN is _____ bytes.
   a) 64 b) 640 c) 1500 d) 6400

3) LAN 802.4 is _____ standard.
   a) Analog b) Digital
   c) Both analog and digital d) None of given

4) ARP is used to find _____ address of a host.
   a) Physical address b) IP address
   c) Port address d) Computer

5) Router is layer _____ device.
   a) Three b) Two c) One d) All

P.T.O.

6) TCP uses _____ protocol for flow control.
   a) UDP b) IP
   c) Sliding window d) Stop_and_wait

7) Shortest path routing algorithm is an example of _____ routing protocol.
   a) Static b) Dynamic
   c) Flexible d) None of the above

8) UDP packets have a fixed-size header of _____ bytes.
   a) 8 b) 16
   c) 40 d) None of the above

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) Which statement for TCP is false ?
   a) Connection oriented transfer b) Reliable
   c) Don't provide feedback d) Point to point communication

11) In the _____ method, after the station finds the line idle, it sends its frame immediately. If the line is not idle, it continuously senses the line until it finds it idle.
   a) 1 – persistent b) non persistent
   c) p – persistent d) none of the above

12) In _____ topology, if a computer's network cable is broken, whole network goes down.
   a) Bus b) Star
   c) Mesh d) All above

13) Which frame in HDLC doesn't carry sequence in its format ?
   a) I – Frame b) U – Frame
   c) S – Frame d) None of the above

14) In cyclic redundancy what is CRC ?
   a) Divisor b) Dividend
   c) Quotient d) Reminder

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SLR-TJ – 171

Seat No.	

B.E. (Electronics Engineering) (Part – I) (New CGPA) Examination, 2017
COMPUTER NETWORK

Day and Date : Thursday, 30-11-2017 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 if ***necessary****.*

SECTION – I

2. Answer **any four** : **(4×4=16)**

1) Define Shannon's theorem to find channel capacity ? Find maximum data rate for a telephone network with BW = 3 KHz and SNR = 20.
2) What is Hamming distance ? Find Hamming codeword for a character F = 1000110. Assume even parity. What is the limitation of Hamming code method ?
3) Discuss Go_Back_N ARQ and selective repeat ARQ related to sliding window flow control method.
4) Explain various CSMA method in detail. Whose performance is better amongst all ?
5) What is static and dynamic channel allocation ? What is drawback of static channel allocation ? Specify various assumptions made in dynamic channel allocation.

3. Answer **any two** : **(2×6=12)**

1) Explain Stop_and _Wait flow control mechanism in short and derive expression for its link utilization efficiency.

   A channel operating at 4800 bps has propagation delay of 20 ms, what should be the minimum frame size for Stop_and _Wait flow control to get 60% link utilization efficiency ?
2) What are types of stations, modes of data transfer in HDLC ? Draw frame format for information exchange in HDLC. Discuss control fields of I, S and U frame in HDLC.
3) List various network devices used in networking.

   What is token ? Draw frame format for IEEE 802.5 LAN standard and explain in detail. How frame acknowledgement is achieved in this LAN standard ?

SECTION – II

4. Answer **any four** : **(4×4=16)**

1) What is host and net id in case of IP address ? What is mask and subnetting related to IP ? What are the classes of given IP addresses ?
   i) 4.23.145.90
   ii) 129.6.8.4

2) What encapsulation and decapsulation in TCP/IP ? Discuss three way handshake in TCP.

3) What is the role of ICMP ? Specify different ICMP messages and their meanings.

4) Draw header format of ARP packet and explain each field in detail.

5) Discuss software defined networking .

5. Answer **any two** : **(2×6=12)**

1) What is difference between host to host and process to process communication ? Draw IP header format and explain neatly.

2) What is principle of optimality and fairness in routing ? Discuss flow based routing algorithm in detail.

3) Draw UDP packet format and explain its header. Compare between TCP and UDP.

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SLR-TJ – 171

Seat No.	

Set **S**

B.E. (Electronics Engineering) (Part – I) (New CGPA) Examination, 2017
COMPUTER NETWORK

Day and Date : Thursday, 30-11-2017 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) Figures to the **right** indicate **full** marks.*
*4) Assume suitable data if **necessary**.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) TCP uses _____ protocol for flow control.
   a) UDP b) IP
   c) Sliding window d) Stop_and_wait

2) Shortest path routing algorithm is an example of _____ routing protocol.
   a) Static b) Dynamic
   c) Flexible d) None of the above

3) UDP packets have a fixed-size header of _____ bytes.
   a) 8 b) 16
   c) 40 d) None of the above

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) Which statement for TCP is false ?
   a) Connection oriented transfer b) Reliable
   c) Don't provide feedback d) Point to point communication

6) In the _____ method, after the station finds the line idle, it sends its frame immediately. If the line is not idle, it continuously senses the line until it finds it idle.
   a) 1 – persistent
   b) non persistent
   c) p – persistent
   d) none of the above

7) In _____ topology, if a computer's network cable is broken, whole network goes down.
   a) Bus
   b) Star
   c) Mesh
   d) All above

8) Which frame in HDLC doesn't carry sequence in its format ?
   a) I – Frame
   b) U – Frame
   c) S – Frame
   d) None of the above

9) In cyclic redundancy what is CRC ?
   a) Divisor
   b) Dividend
   c) Quotient
   d) Reminder

10) In bit stuffing, the length of the original data
   a) Remains same
   b) Increases
   c) Decreases
   d) Increases exponentially

11) The minimum frame size for 10 Mbps LAN is _____ bytes.
   a) 64 b) 640 c) 1500 d) 6400

12) LAN 802.4 is _____ standard.
   a) Analog
   b) Digital
   c) Both analog and digital
   d) None of given

13) ARP is used to find _____ address of a host.
   a) Physical address
   b) IP address
   c) Port address
   d) Computer

14) Router is layer _____ device.
   a) Three b) Two c) One d) All

_____

SLR-TJ – 171

Seat No.	

B.E. (Electronics Engineering) (Part – I) (New CGPA) Examination, 2017
COMPUTER NETWORK

Day and Date : Thursday, 30-11-2017 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 if ***necessary****.*

SECTION – I

2. Answer **any four** : **(4×4=16)**

1) Define Shannon's theorem to find channel capacity ? Find maximum data rate for a telephone network with BW = 3 KHz and SNR = 20.
2) What is Hamming distance ? Find Hamming codeword for a character F = 1000110. Assume even parity. What is the limitation of Hamming code method ?
3) Discuss Go_Back_N ARQ and selective repeat ARQ related to sliding window flow control method.
4) Explain various CSMA method in detail. Whose performance is better amongst all ?
5) What is static and dynamic channel allocation ? What is drawback of static channel allocation ? Specify various assumptions made in dynamic channel allocation.

3. Answer **any two** : **(2×6=12)**

1) Explain Stop_and _Wait flow control mechanism in short and derive expression for its link utilization efficiency.

   A channel operating at 4800 bps has propagation delay of 20 ms, what should be the minimum frame size for Stop_and _Wait flow control to get 60% link utilization efficiency ?
2) What are types of stations, modes of data transfer in HDLC ? Draw frame format for information exchange in HDLC. Discuss control fields of I, S and U frame in HDLC.
3) List various network devices used in networking.

   What is token ? Draw frame format for IEEE 802.5 LAN standard and explain in detail. How frame acknowledgement is achieved in this LAN standard ?

SECTION – II

4. Answer **any four** : **(4×4=16)**

1) What is host and net id in case of IP address ? What is mask and subnetting related to IP ? What are the classes of given IP addresses ?
   i) 4.23.145.90
   ii) 129.6.8.4

2) What encapsulation and decapsulation in TCP/IP ? Discuss three way handshake in TCP.

3) What is the role of ICMP ? Specify different ICMP messages and their meanings.

4) Draw header format of ARP packet and explain each field in detail.

5) Discuss software defined networking .

5. Answer **any two** : **(2×6=12)**

1) What is difference between host to host and process to process communication ? Draw IP header format and explain neatly.

2) What is principle of optimality and fairness in routing ? Discuss flow based routing algorithm in detail.

3) Draw UDP packet format and explain its header. Compare between TCP and UDP.

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SLR-TJ – 172

Seat No.	

Set P

B.E. (Electronics Engineering) (New CGPA) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Monday, 4-12-2017 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) Figures to the **right** indicates **full** marks.*

*4) **Assume** suitable data if necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct alternatives **14**

1) Radio channel used for a call set up is _____ channel.
   a) Data b) Voice c) Control d) Management

2) A center excited cell uses _____ antenna.
   a) Omnidirectional b) Sector directional
   c) Yagi d) Dipole

3) If N is cluster size, 1/N is
   a) Frequency reuse factor b) Capacity
   c) No. of channels d) None of above

4) The signals are function of _____
   a) Time b) Location c) Both d) None

5) Submarine communication use _____ propagation.
   a) Ground wave b) Sky wave c) Line of sight d) All of the above

6) Channel data rates are _____ in CDMA systems.
   a) Very low b) Very high
   c) Moderate d) None of the above

P.T.O.

7) The cell size in CDMA is _____ compared to GSM.
   a) Larger b) Smaller
   c) Same d) None of the above

8) Which of below is a standard for WPANs ?
   a) IEEE 802.11 b) IEEE 802.3 c) IEEE 802.15 d) WATM

9) The mechanism used in M-TCP is _____
   a) Splits TCP connection in to two
   b) Splits TCP connections, choke sender
   c) Snoop data
   d) Snoops data and acknowledgement

10) After obtaining the IP address, to prevent the IP conflict the client may use
   a) Internet relay chat b) Broader gateway protocol
   c) Address resolution protocol d) None of the mentioned

11) What is DHCP snooping ?
   a) Techniques applied to ensure the security of an existing DHCP infrastructure
   b) Encryption of the DHCP server requests
   c) Algorithm for DHCP
   d) None of the mentioned

12) Which one of the following event is not possible in wireless LAN ?
   a) Collision detection b) Acknowledgement of data frames
   c) Multi-mode data transmission d) None of the mentioned

13) In the piconet of bluetooth one master device
   a) Cannot be slave b) Can be slave in another piconet
   c) Can be slave in the same piconet d) None of the mentioned

14) Indirect TCP is segmentation of the single TCP connection into _____ connection.
   a) Two TCP b) Multiple TCP c) Six TCP d) None of these

_____

SLR-TJ – 172

Seat No.	

B.E. (Electronics Engineering) (New CGPA) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Monday, 4-12-2017 Marks : 56

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

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

*2) **Assume** suitable data if necessary.*

SECTION – I

2. Attempt **any four** : **16**

a) With suitable example and diagram explain FHSS.

b) What is soft and hard handoff ?

c) Explain Blocked Calls Cleared Trunking.

d) Explain a mobile originated call sequence in GSM.

e) What are the different numbers used in GSM for localizations of MS.

3. Attempt **any two** : **12**

1) What is microcell zone concept ? With suitable example show how it improves capacity in a cellular system.

2) With suitable diagram explain GSM time frame of 4.615 ms and a time slot of 577 μ S.

3) Explain Walsh code spreading in forward traffic channel in detail for IS95.

SECTION – II

4. Attempt **any four** : **16**

   a) With suitable example describe disadvantages of wireless LAN over its wired counter part.

   b) Describe ad-hoc architecture for IEEE 802.11.

   c) What is the difference between middleware and gateways ?

   d) What are different dialogue controls in mobile computing ? Explain with example.

   e) What is agent solicitation ? Why it is required ?

5. Attempt **any two** : **12**

   a) Draw protocol stack and explain each component in brief of Bluetooth.

   b) What is DHCP ? What are its applications ? With suitable diagram explain basic DHCP configuration.

   c) With suitable diagram and packet explain a registration of a MN with FA.

SLR-TJ – 172

Seat No.	

Set Q

B.E. (Electronics Engineering) (New CGPA) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Monday, 4-12-2017 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) Figures to the **right** indicates **full** marks.*

*4) **Assume** suitable data if necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct alternatives **14**

1) Which of below is a standard for WPANs ?
   a) IEEE 802.11 b) IEEE 802.3 c) IEEE 802.15 d) WATM

2) The mechanism used in M-TCP is _____
   a) Splits TCP connection in to two
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   a) Internet relay chat b) Broader gateway protocol
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4) What is DHCP snooping ?
   a) Techniques applied to ensure the security of an existing DHCP infrastructure
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   c) Algorithm for DHCP
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5) Which one of the following event is not possible in wireless LAN ?
   a) Collision detection b) Acknowledgement of data frames
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   a) Cannot be slave b) Can be slave in another piconet
   c) Can be slave in the same piconet d) None of the mentioned

7) Indirect TCP is segmentation of the single TCP connection into _____ connection.
   a) Two TCP b) Multiple TCP c) Six TCP d) None of these

8) Radio channel used for a call set up is _____ channel.
   a) Data b) Voice c) Control d) Management

9) A center excited cell uses _____ antenna.
   a) Omnidirectional b) Sector directional
   c) Yagi d) Dipole

10) If N is cluster size, 1/N is
   a) Frequency reuse factor b) Capacity
   c) No. of channels d) None of above

11) The signals are function of _____
   a) Time b) Location c) Both d) None

12) Submarine communication use _____ propagation.
   a) Ground wave b) Sky wave c) Line of sight d) All of the above

13) Channel data rates are _____ in CDMA systems.
   a) Very low b) Very high
   c) Moderate d) None of the above

14) The cell size in CDMA is _____ compared to GSM.
   a) Larger b) Smaller
   c) Same d) None of the above

_____

SLR-TJ – 172

Seat No.	

B.E. (Electronics Engineering) (New CGPA) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Monday, 4-12-2017 Marks : 56

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

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

*2) **Assume** suitable data if necessary.*

SECTION – I

2. Attempt **any four** : **16**

a) With suitable example and diagram explain FHSS.

b) What is soft and hard handoff ?

c) Explain Blocked Calls Cleared Trunking.

d) Explain a mobile originated call sequence in GSM.

e) What are the different numbers used in GSM for localizations of MS.

3. Attempt **any two** : **12**

1) What is microcell zone concept ? With suitable example show how it improves capacity in a cellular system.

2) With suitable diagram explain GSM time frame of 4.615 ms and a time slot of 577 μ S.

3) Explain Walsh code spreading in forward traffic channel in detail for IS95.

SECTION – II

4. Attempt **any four** : **16**

   a) With suitable example describe disadvantages of wireless LAN over its wired counter part.

   b) Describe ad-hoc architecture for IEEE 802.11.

   c) What is the difference between middleware and gateways ?

   d) What are different dialogue controls in mobile computing ? Explain with example.

   e) What is agent solicitation ? Why it is required ?

5. Attempt **any two** : **12**

   a) Draw protocol stack and explain each component in brief of Bluetooth.

   b) What is DHCP ? What are its applications ? With suitable diagram explain basic DHCP configuration.

   c) With suitable diagram and packet explain a registration of a MN with FA.

SLR-TJ – 172

Seat No.	

Set R

B.E. (Electronics Engineering) (New CGPA) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Monday, 4-12-2017 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) Figures to the **right** indicates **full** marks.*

*4) **Assume** suitable data if necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct alternatives **14**

1) Submarine communication use _____ propagation.
   a) Ground wave b) Sky wave c) Line of sight d) All of the above

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   c) Moderate d) None of the above

3) The cell size in CDMA is _____ compared to GSM.
   a) Larger b) Smaller
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4) Which of below is a standard for WPANs ?
   a) IEEE 802.11 b) IEEE 802.3 c) IEEE 802.15 d) WATM

5) The mechanism used in M-TCP is _____
   a) Splits TCP connection in to two
   b) Splits TCP connections, choke sender
   c) Snoop data
   d) Snoops data and acknowledgement

6) After obtaining the IP address, to prevent the IP conflict the client may use
   a) Internet relay chat
   b) Broader gateway protocol
   c) Address resolution protocol
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   c) Control
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12) A center excited cell uses _____ antenna.
   a) Omnidirectional
   b) Sector directional
   c) Yagi
   d) Dipole

13) If N is cluster size, 1/N is
   a) Frequency reuse factor
   b) Capacity
   c) No. of channels
   d) None of above

14) The signals are function of _____
   a) Time
   b) Location
   c) Both
   d) None

_____

SLR-TJ – 172

Seat No.	

B.E. (Electronics Engineering) (New CGPA) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Monday, 4-12-2017 Marks : 56

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

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

*2) **Assume** suitable data if necessary.*

SECTION – I

2. Attempt **any four** : **16**

a) With suitable example and diagram explain FHSS.

b) What is soft and hard handoff ?

c) Explain Blocked Calls Cleared Trunking.

d) Explain a mobile originated call sequence in GSM.

e) What are the different numbers used in GSM for localizations of MS.

3. Attempt **any two** : **12**

1) What is microcell zone concept ? With suitable example show how it improves capacity in a cellular system.

2) With suitable diagram explain GSM time frame of 4.615 ms and a time slot of 577 μ S.

3) Explain Walsh code spreading in forward traffic channel in detail for IS95.

SECTION – II

4. Attempt **any four** : **16**

   a) With suitable example describe disadvantages of wireless LAN over its wired counter part.

   b) Describe ad-hoc architecture for IEEE 802.11.

   c) What is the difference between middleware and gateways ?

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5. Attempt **any two** : **12**

   a) Draw protocol stack and explain each component in brief of Bluetooth.

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SLR-TJ – 172

Seat No.	

Set S

B.E. (Electronics Engineering) (New CGPA) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Monday, 4-12-2017 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.*

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

*4) **Assume** suitable data if necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

1. Choose the correct alternatives **14**

1) After obtaining the IP address, to prevent the IP conflict the client may use
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   b) Broader gateway protocol
   c) Address resolution protocol
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2) What is DHCP snooping ?
   a) Techniques applied to ensure the security of an existing DHCP infrastructure
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P.T.O.

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_____

SLR-TJ – 172

Seat No.	

B.E. (Electronics Engineering) (New CGPA) (Part – I) Examination, 2017
MOBILE TECHNOLOGY

Day and Date : Monday, 4-12-2017 Marks : 56

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

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

*2) **Assume** suitable data if necessary.*

SECTION – I

2. Attempt **any four** : **16**

a) With suitable example and diagram explain FHSS.

b) What is soft and hard handoff ?

c) Explain Blocked Calls Cleared Trunking.

d) Explain a mobile originated call sequence in GSM.

e) What are the different numbers used in GSM for localizations of MS.

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1) What is microcell zone concept ? With suitable example show how it improves capacity in a cellular system.

2) With suitable diagram explain GSM time frame of 4.615 ms and a time slot of 577 μ S.

3) Explain Walsh code spreading in forward traffic channel in detail for IS95.

SECTION – II

4. Attempt **any four** : **16**

   a) With suitable example describe disadvantages of wireless LAN over its wired counter part.

   b) Describe ad-hoc architecture for IEEE 802.11.

   c) What is the difference between middleware and gateways ?

   d) What are different dialogue controls in mobile computing ? Explain with example.

   e) What is agent solicitation ? Why it is required ?

5. Attempt **any two** : **12**

   a) Draw protocol stack and explain each component in brief of Bluetooth.

   b) What is DHCP ? What are its applications ? With suitable diagram explain basic DHCP configuration.

   c) With suitable diagram and packet explain a registration of a MN with FA.

SLR-TJ – 173

Seat No.	

Set P

B.E. (Electronics) (New – CGPA) (Part – I) Examination, 2017
ELECTRONICS SYSTEM DESIGN

Day and Date : Wednesday, 6-12-2017 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 **wherever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

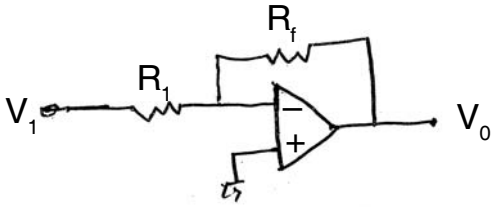
1) Electronic product are classified into three different categories based on
   a) Operating temperature range b) Reliability of quality
   c) Either a) or b) d) Both a) and b)

2) The waveform capturing rate of _____ is the highest.
   a) Analog CRO b) DSO c) DPO d) MSO

3) The logic analyzer can accept _____ trigger level(s).
   a) One b) Two c) Four d) More than four

4) MOV stands for
   a) Metal Oxide Varistors b) Metal Oxygen Varistors
   c) Metal Oxide Variable d) None of the above

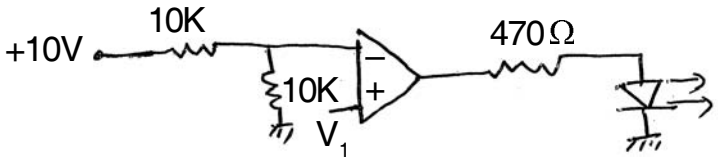
5) The circuit shown below uses



   a) voltage series feedback b) voltage shunt feedback
   c) current series feedback d) current shunt feedback

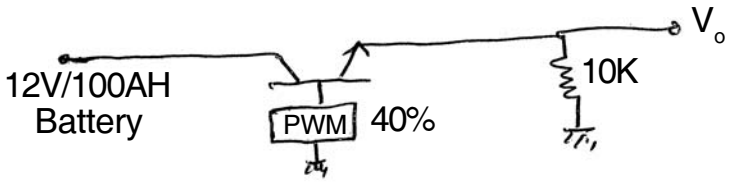
P.T.O.

6) In the circuit shown below LED will be On if V_1 is



a) >10 V b) < 10 V c) > 5 V d) < 5 V

7) What is the output of the following circuit ?



a) 58 V b) 4.8 V c) 0.48 V d) 0.58 V

8) The software structure design uses
   a) Bottom to top approach b) Top to bottom approach
   c) Linear approach d) Can't say

9) A good program must satisfy _____ requirements.
   a) User's expectations b) Error free, efficient
   c) User friendly d) All the above

10) The module can be decided based on
   a) Function b) User's requirement
   c) Cost d) Complexity of the program

11) The sinusoidal test for vibration works on the principle of
   a) Fixed amplitude b) Variable amplitude
   c) Fixed frequency d) Variable frequency

12) In random vibration test, PDS is expressed as
   a) g/Hz b) g^2/Hz c) Hz/g d) Hz/g^2

13) The document prepared for funding of a product is called
   a) Proposal b) Manual
   c) Memo d) Engineering diary

14) The document used to introduce a product is called
   a) Proposal b) Manual
   c) Brochure d) Engineering diary

_____

SLR-TJ – 173

Seat No.	

B.E. (Electronics) (New – CGPA) (Part – I) Examination, 2017
ELECTRONICS SYSTEM DESIGN

Day and Date : Wednesday, 6-12-2017 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. Answer **any four** : **(4×4=16)**

   a) What are the different types of product requirement ?

   b) Explain operation of DSO using block diagram.

   c) Compare centralized power architecture and distributed power architecture.

   d) Draw and explain off-the-line power supply.

   e) Describe the noise and error consideration in signal processing.

3. Answer **any two** : **(2×6=12)**

   a) Draw the block diagram of spectrum analyzer and explain it.

   b) Draw and explain instrumentation amplifier.

   c) Explain different protection circuits of SMPS.

SECTION – II

4. Answer **any four** : **(4×4=16)**

   a) What are the goals of software design ?

   b) Explain different constructs of regular program.

c) Explain different vibration tests that should be carried out on an industrial product.

d) Write a short note on CE marking.

e) What is the role of documentation in product design and development ?

5. Answer **any two** : **(2×6=12)**

a) Explain with the help of real life microprocessor based product, how all recommended steps in a software development are implemented.

b) Explain different temperature tests carried out in an industrial product and various parameters related to each test.

c) How Bill of Material is prepared for any circuit used in the product ? Explain with a proper example.

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SLR-TJ – 173

Seat No.	

Set Q

B.E. (Electronics) (New – CGPA) (Part – I) Examination, 2017
ELECTRONICS SYSTEM DESIGN

Day and Date : Wednesday, 6-12-2017 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 **wherever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The software structure design uses
   a) Bottom to top approach b) Top to bottom approach
   c) Linear approach d) Can't say

2) A good program must satisfy _____ requirements.
   a) User's expectations b) Error free, efficient
   c) User friendly d) All the above

3) The module can be decided based on
   a) Function b) User's requirement
   c) Cost d) Complexity of the program

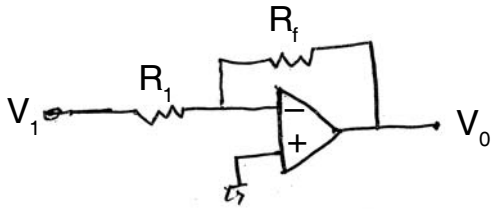
4) The sinusoidal test for vibration works on the principle of
   a) Fixed amplitude b) Variable amplitude
   c) Fixed frequency d) Variable frequency

5) In random vibration test, PDS is expressed as
   a) g/Hz b) g^2/Hz c) Hz/g d) Hz/g^2

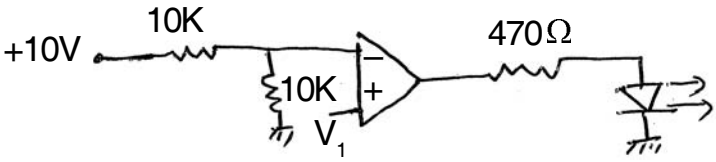
6) The document prepared for funding of a product is called
   a) Proposal b) Manual
   c) Memo d) Engineering diary

P.T.O.

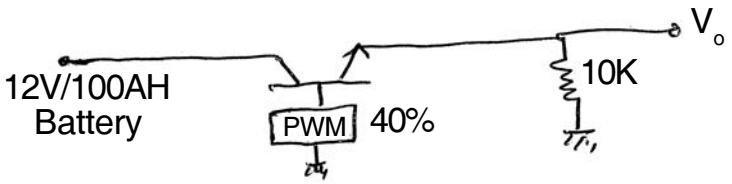
7) The document used to introduce a product is called
   a) Proposal b) Manual
   c) Brochure d) Engineering diary
8) Electronic product are classified into three different categories based on
   a) Operating temperature range b) Reliability of quality
   c) Either a) or b) d) Both a) and b)
9) The waveform capturing rate of _____ is the highest.
   a) Analog CRO b) DSO c) DPO d) MSO
10) The logic analyzer can accept _____ trigger level(s).
   a) One b) Two c) Four d) More than four
11) MOV stands for
   a) Metal Oxide Varistors b) Metal Oxygen Varistors
   c) Metal Oxide Variable d) None of the above
12) The circuit shown below uses



   a) voltage series feedback b) voltage shunt feedback
   c) current series feedback d) current shunt feedback
13) In the circuit shown below LED will be On if V_1 is



   a) >10 V b) < 10 V c) > 5 V d) < 5 V
14) What is the output of the following circuit ?



   a) 58 V b) 4.8 V c) 0.48 V d) 0.58 V

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SLR-TJ – 173

Seat No.	

B.E. (Electronics) (New – CGPA) (Part – I) Examination, 2017
ELECTRONICS SYSTEM DESIGN

Day and Date : Wednesday, 6-12-2017 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. Answer **any four** : **(4×4=16)**

   a) What are the different types of product requirement ?

   b) Explain operation of DSO using block diagram.

   c) Compare centralized power architecture and distributed power architecture.

   d) Draw and explain off-the-line power supply.

   e) Describe the noise and error consideration in signal processing.

3. Answer **any two** : **(2×6=12)**

   a) Draw the block diagram of spectrum analyzer and explain it.

   b) Draw and explain instrumentation amplifier.

   c) Explain different protection circuits of SMPS.

SECTION – II

4. Answer **any four** : **(4×4=16)**

   a) What are the goals of software design ?

   b) Explain different constructs of regular program.

c) Explain different vibration tests that should be carried out on an industrial product.

d) Write a short note on CE marking.

e) What is the role of documentation in product design and development ?

5. Answer **any two** : **(2×6=12)**

a) Explain with the help of real life microprocessor based product, how all recommended steps in a software development are implemented.

b) Explain different temperature tests carried out in an industrial product and various parameters related to each test.

c) How Bill of Material is prepared for any circuit used in the product ? Explain with a proper example.

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SLR-TJ – 173

Seat No.	

Set R

B.E. (Electronics) (New – CGPA) (Part – I) Examination, 2017
ELECTRONICS SYSTEM DESIGN

Day and Date : Wednesday, 6-12-2017 Total Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

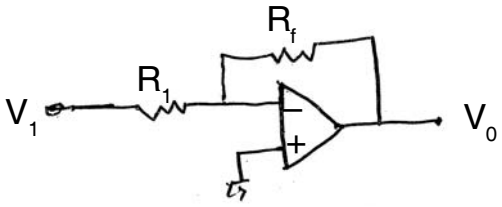
Instructions *: 1) Q. No.* ***1*** *is* ***compulsory****. It should be solved in* ***first 30 minutes*** *in Answer Book Page No.* ***3****.* ***Each*** *question carries* ***one*** *mark.*
2) ***Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

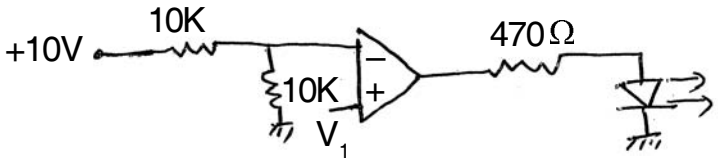
1. Choose the correct answer : **(14×1=14)**

1) The circuit shown below uses



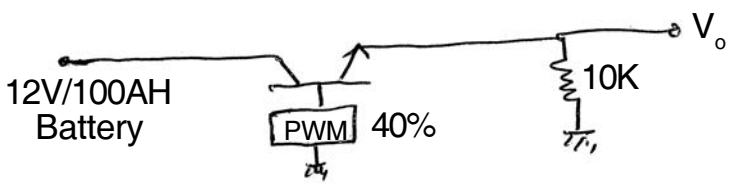
a) voltage series feedback b) voltage shunt feedback
c) current series feedback d) current shunt feedback

2) In the circuit shown below LED will be On if V_1 is



a) >10 V b) < 10 V c) > 5 V d) < 5 V

3) What is the output of the following circuit ?



a) 58 V b) 4.8 V c) 0.48 V d) 0.58 V

P.T.O.

4) The software structure design uses
   a) Bottom to top approach b) Top to bottom approach
   c) Linear approach d) Can't say
5) A good program must satisfy _____ requirements.
   a) User's expectations b) Error free, efficient
   c) User friendly d) All the above
6) The module can be decided based on
   a) Function b) User's requirement
   c) Cost d) Complexity of the program
7) The sinusoidal test for vibration works on the principle of
   a) Fixed amplitude b) Variable amplitude
   c) Fixed frequency d) Variable frequency
8) In random vibration test, PDS is expressed as
   a) g/Hz b) g^2/Hz c) Hz/g d) Hz/g^2
9) The document prepared for funding of a product is called
   a) Proposal b) Manual
   c) Memo d) Engineering diary
10) The document used to introduce a product is called
   a) Proposal b) Manual
   c) Brochure d) Engineering diary
11) Electronic product are classified into three different categories based on
   a) Operating temperature range b) Reliability of quality
   c) Either a) or b) d) Both a) and b)
12) The waveform capturing rate of _____ is the highest.
   a) Analog CRO b) DSO c) DPO d) MSO
13) The logic analyzer can accept _____ trigger level(s).
   a) One b) Two c) Four d) More than four
14) MOV stands for
   a) Metal Oxide Varistors b) Metal Oxygen Varistors
   c) Metal Oxide Variable d) None of the above

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SLR-TJ – 173

Seat No.	

B.E. (Electronics) (New – CGPA) (Part – I) Examination, 2017
ELECTRONICS SYSTEM DESIGN

Day and Date : Wednesday, 6-12-2017 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. Answer **any four** : **(4×4=16)**

   a) What are the different types of product requirement ?

   b) Explain operation of DSO using block diagram.

   c) Compare centralized power architecture and distributed power architecture.

   d) Draw and explain off-the-line power supply.

   e) Describe the noise and error consideration in signal processing.

3. Answer **any two** : **(2×6=12)**

   a) Draw the block diagram of spectrum analyzer and explain it.

   b) Draw and explain instrumentation amplifier.

   c) Explain different protection circuits of SMPS.

SECTION – II

4. Answer **any four** : **(4×4=16)**

   a) What are the goals of software design ?

   b) Explain different constructs of regular program.

c) Explain different vibration tests that should be carried out on an industrial product.

d) Write a short note on CE marking.

e) What is the role of documentation in product design and development ?

5. Answer **any two** : **(2×6=12)**

a) Explain with the help of real life microprocessor based product, how all recommended steps in a software development are implemented.

b) Explain different temperature tests carried out in an industrial product and various parameters related to each test.

c) How Bill of Material is prepared for any circuit used in the product ? Explain with a proper example.

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SLR-TJ – 173

Seat No.	

Set **S**

B.E. (Electronics) (New – CGPA) (Part – I) Examination, 2017
ELECTRONICS SYSTEM DESIGN

Day and Date : Wednesday, 6-12-2017 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 **wherever** necessary.*

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 14

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

1) The module can be decided based on
   a) Function b) User's requirement
   c) Cost d) Complexity of the program

2) The sinusoidal test for vibration works on the principle of
   a) Fixed amplitude b) Variable amplitude
   c) Fixed frequency d) Variable frequency

3) In random vibration test, PDS is expressed as
   a) g/Hz b) g^2/Hz c) Hz/g d) Hz/g^2

4) The document prepared for funding of a product is called
   a) Proposal b) Manual
   c) Memo d) Engineering diary

5) The document used to introduce a product is called
   a) Proposal b) Manual
   c) Brochure d) Engineering diary

6) Electronic product are classified into three different categories based on
   a) Operating temperature range b) Reliability of quality
   c) Either a) or b) d) Both a) and b)

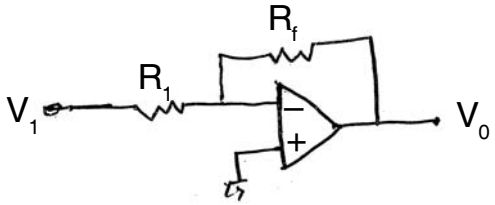
P.T.O.

7) The waveform capturing rate of _____ is the highest.
   a) Analog CRO b) DSO c) DPO d) MSO

8) The logic analyzer can accept _____ trigger level(s).
   a) One b) Two c) Four d) More than four

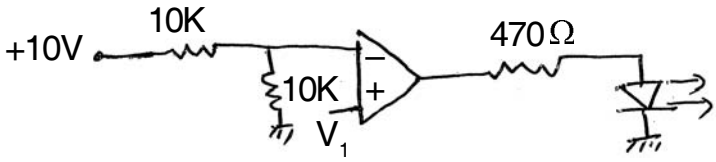
9) MOV stands for
   a) Metal Oxide Varistors b) Metal Oxygen Varistors
   c) Metal Oxide Variable d) None of the above

10) The circuit shown below uses



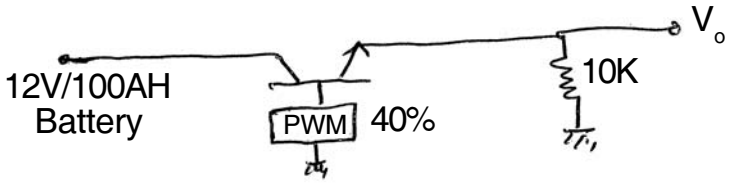
   a) voltage series feedback b) voltage shunt feedback
   c) current series feedback d) current shunt feedback

11) In the circuit shown below LED will be On if V_1 is



   a) >10 V b) < 10 V c) > 5 V d) < 5 V

12) What is the output of the following circuit ?



   a) 58 V b) 4.8 V c) 0.48 V d) 0.58 V

13) The software structure design uses
   a) Bottom to top approach b) Top to bottom approach
   c) Linear approach d) Can't say

14) A good program must satisfy _____ requirements.
   a) User's expectations b) Error free, efficient
   c) User friendly d) All the above

_____

SLR-TJ – 173

Seat No.	

B.E. (Electronics) (New – CGPA) (Part – I) Examination, 2017
ELECTRONICS SYSTEM DESIGN

Day and Date : Wednesday, 6-12-2017 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. Answer **any four** : **(4×4=16)**

a) What are the different types of product requirement ?

b) Explain operation of DSO using block diagram.

c) Compare centralized power architecture and distributed power architecture.

d) Draw and explain off-the-line power supply.

e) Describe the noise and error consideration in signal processing.

3. Answer **any two** : **(2×6=12)**

a) Draw the block diagram of spectrum analyzer and explain it.

b) Draw and explain instrumentation amplifier.

c) Explain different protection circuits of SMPS.

SECTION – II

4. Answer **any four** : **(4×4=16)**

a) What are the goals of software design ?

b) Explain different constructs of regular program.

c) Explain different vibration tests that should be carried out on an industrial product.

d) Write a short note on CE marking.

e) What is the role of documentation in product design and development ?

5. Answer **any two** : **(2×6=12)**

a) Explain with the help of real life microprocessor based product, how all recommended steps in a software development are implemented.

b) Explain different temperature tests carried out in an industrial product and various parameters related to each test.

c) How Bill of Material is prepared for any circuit used in the product ? Explain with a proper example.

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SLR-TJ – 175

Seat No.	

Set P

B.E. (Electronics Engineering) Part – I (New CGPA) Examination, 2017
MECHATRONICS (Elective – I)

Day and Date : Friday, 8-12-2017 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 ***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 : **(14×1=14)**

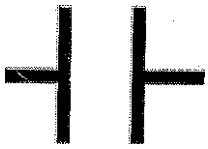
1) The resolution of an analogue to digital converter with a word length of 10 bits and an analogue signal input range of 10V is
   a) 9.76 mV b) 4.8 mV c) 1.25 mV d) 39 mV

2) The term PLC stands for
   a) Personal Logic Computer
   b) Programmable Logic Computer
   c) Personal Logic Controller
   d) Programmable Logic Controller

3) A counter that starts from a specified number and increments or decrements count is
   a) Up/Down counter b) Down counter
   c) Cascading counter d) Reset counter

4) The PLC can be programmed using _____ programming.
   a) Ladder diagram
   b) Structural text
   c) Functional block diagram
   d) All of the above

5) The PLC contact shown in figure is



a) A normally open contact b) An output
c) A normally closed contact d) A timer

6) A sensor, for an input of 5V gives a digital output of a word of 10 bits. Resolution approximately is
a) 5/10 V b) 10/5 V c) $5/2^{10}$ V d) $2^5/10$ V

7) A controller is essentially
a) Sensor b) Clipper c) Comparator d) Amplifier

8) _____ is doping process whereby dopant ions are introduced into the material of interest to change its property.
a) Etching b) Ion Implantation
c) Diffusion d) Evaporation

9) The 2's complement representation of number 0 is
a) 00000000 b) 00000001 c) 11111110 d) 11111111

10) DC motor speed control can be achieved using
a) PWM b) Frequency modulation
c) Amplitude modulation d) None of the above

11) A _____ actuator uses a pressurized oil to drive a piston.
a) Pneumatic b) Hydraulic
c) Electric d) None of the above

12) _____ is process, in which impure material is added to a material of interest.
a) Etching b) Implantation
c) Doping d) Evaporation

13) Actuators are interfaced with _____ card of the PLC.
a) Memory b) Input c) Output d) Power

14) For optical encoders the _____ code is preferred over the binary code.
a) Gray b) ASCII c) BCD d) Excess 3

_____

SLR-TJ – 175

Seat No.	

B.E. (Electronics Engineering) Part – I (New CGPA) Examination, 2017
MECHATRONICS (Elective – I)

Day and Date : Friday, 8-12-2017 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 ***wherever*** *necessary.*

SECTION – I

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

a) Draw the simple sketch and explain the characteristics of the separately excited motor D.C. motor.

b) Give the characteristics of positive feedback system.

c) Explain in detail about the ladder diagram programming of a PLC.

d) Draw the FBD symbols for AND, OR, EXOR, NAND and NOR operations.

e) Explain the possible mechatronics design process stages.

3. Attempt **any two** : **(6×2=12)**

a) Derive a mathematical model for derivative controller. Explain electronic derivative (D) controller with necessary circuit diagrams.

b) Explain the basic structures of PLC. Explain in detail about the programming of a PLC. What are the advantages of PLC ?

c) A motor is switched on by pressing a spring-return push button start switch, and the motor remains on until another spring-return push button stop switch is pressed. Draw and explain the ladder diagram for the above operation.

SECTION – II

4. Attempt **any four** : **(4×4=16)**
   a) Define MEMS. What are its advantages ?
   b) Distinguish between traditional design approach and mechatronics approach.
   c) What is doping ? Explain doping of semi-conductors.
   d) Write a short note on piezo-electric sensors.
   e) What is etching ? Explain in detail wet classes of etching process.

5. Attempt **any two** : **(6×2=12)**
   a) Describe the working of pneumatic process control valve with neat sketch.
   b) Describe a mechatronics system for an automatic washing machine with neat diagram.
   c) Explain any three sensors for measuring displacement with neat sketch.

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SLR-TJ – 176

Seat No.	

Set P

B.E. (Electronics Engineering) (New) (CGPA – Part – I) Examination, 2017
Elective – I : IMAGE PROCESSING

Day and Date : Friday, 8-12-2017 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 : **14**

1) What is image ?
   a) Picture b) Collection of pixel
   c) Matrix of pixel d) All of these

2) Image enhancement and restoration are used to process
   a) High resolution images b) Degraded images
   c) High quality images d) Brighter images

3) Gradient computation equation is
   a) |Gx| + |Gy| b) |Gx| – |Gy|
   c) |Gx| / |Gy| d) |Gx| x |Gy|

4) Discontinuity approach of segmentation depends upon
   a) Low frequencies b) Smooth changes
   c) Abrupt changes d) Contrast

5) Two regions are said to be adjacent if their union forms
   a) connected set b) region
   c) boundaries d) image

6) 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)

7) Process of manipulating the digital image to make results more suitable is called
   a) manipulation b) improvement
   c) enhancement d) degradation

8) High pass filters are used for image
   a) contrast b) sharpening
   c) blurring d) resizing

9) Thresholding function in contrast stretching creates
   a) binary image b) high quality image
   c) enhanced image d) low quality image

10) 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)

11) Process involved in linear spatial filtering is
   a) correlation b) convolution
   c) histogram equalization d) both a) and b)

12) _____ 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

13) _____ 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

14) 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-TJ – 176

Seat No.	

B.E. (Electronics Engineering) (New) (CGPA – Part – I) Examination, 2017
Elective – I : IMAGE PROCESSING

Day and Date : Friday, 8-12-2017 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)**

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** : **(2×6=12)**

a) What do you mean by Digital Image Processing ? Discuss the different application areas of digital image processing.

b) Compare the basic frequency domain filters.

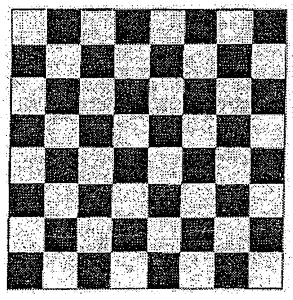
i) Ideal low pass. ii) Butterworth pass.

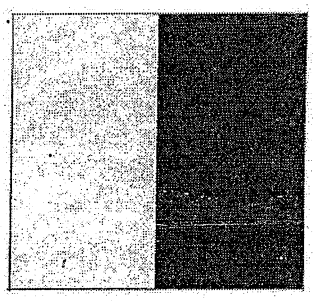
iii) Gaussian low pass.

c) The images shown below have same histograms. Suppose that each image is blurred with a 3 × 3 averaging mask.

a) Would the histogram of blurred images still be equal ? Explain.

b) If your answer is NO, sketch the two histograms.





SECTION – II

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

   a) What is the advantage of sobel operator over prewitt operator ?

   b) Explain region growing.

   c) Write note on signatures.

   d) Explain different compression methods.

   e) Write a note on signatures and skeletons.

5. Attempt **any two** : **(2×6=12)**

   a) Explain following techniques for boundary approximations using polygon :

      a) Minimum perimeter Polygon.

      b) Splitting techniques.

   b) What is global threshold for segmentation ? Give algorithm for obtaining threshold value.

   c) Explain JPEG compression and decompression.

SLR-TJ – 176

Seat No.	

Set **Q**

B.E. (Electronics Engineering) (New) (CGPA – Part – I) Examination, 2017
Elective – I : IMAGE PROCESSING

Day and Date : Friday, 8-12-2017 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 : **14**

1) High pass filters are used for image
   a) contrast b) sharpening
   c) blurring d) resizing

2) Thresholding function in contrast stretching creates
   a) binary image b) high quality image
   c) enhanced image d) low quality image

3) 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)

4) Process involved in linear spatial filtering is
   a) correlation b) convolution
   c) histogram equalization d) both a) and b)

P.T.O.

5) _____ 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

6) _____ 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

7) 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

8) What is image ?
   a) Picture
   b) Collection of pixel
   c) Matrix of pixel
   d) All of these

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| x |Gy|

11) Discontinuity approach of segmentation depends upon
   a) Low frequencies
   b) Smooth changes
   c) Abrupt changes
   d) Contrast

12) Two regions are said to be adjacent if their union forms
   a) connected set
   b) region
   c) boundaries
   d) image

13) 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)

14) Process of manipulating the digital image to make results more suitable is called
   a) manipulation
   b) improvement
   c) enhancement
   d) degradation

_____

SLR-TJ – 176

Seat No.	

B.E. (Electronics Engineering) (New) (CGPA – Part – I) Examination, 2017
Elective – I : IMAGE PROCESSING

Day and Date : Friday, 8-12-2017 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)**

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** : **(2×6=12)**

a) What do you mean by Digital Image Processing ? Discuss the different application areas of digital image processing.

b) Compare the basic frequency domain filters.

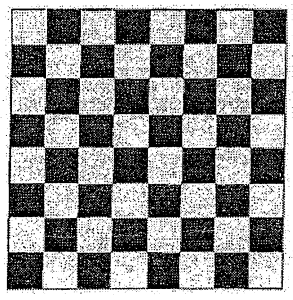
i) Ideal low pass. ii) Butterworth pass.

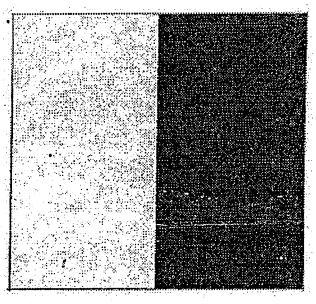
iii) Gaussian low pass.

c) The images shown below have same histograms. Suppose that each image is blurred with a 3 × 3 averaging mask.

a) Would the histogram of blurred images still be equal ? Explain.

b) If your answer is NO, sketch the two histograms.





SECTION – II

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

   a) What is the advantage of sobel operator over prewitt operator ?

   b) Explain region growing.

   c) Write note on signatures.

   d) Explain different compression methods.

   e) Write a note on signatures and skeletons.

5. Attempt **any two** : **(2×6=12)**

   a) Explain following techniques for boundary approximations using polygon :

      a) Minimum perimeter Polygon.

      b) Splitting techniques.

   b) What is global threshold for segmentation ? Give algorithm for obtaining threshold value.

   c) Explain JPEG compression and decompression.

SLR-TJ – 176

Seat No.	

Set **R**

B.E. (Electronics Engineering) (New) (CGPA – Part – I) Examination, 2017
Elective – I : IMAGE PROCESSING

Day and Date : Friday, 8-12-2017 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 : **14**

1) Two regions are said to be adjacent if their union forms
   a) connected set b) region
   c) boundaries d) image

2) 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)

3) Process of manipulating the digital image to make results more suitable is called
   a) manipulation b) improvement
   c) enhancement d) degradation

4) High pass filters are used for image
   a) contrast b) sharpening
   c) blurring d) resizing

P.T.O.

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)

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) Collection of pixel
   c) Matrix of pixel d) All of these

12) Image enhancement and restoration are used to process
   a) High resolution images b) Degraded images
   c) High quality images d) Brighter images

13) Gradient computation equation is
   a) |Gx| + |Gy| b) |Gx| – |Gy|
   c) |Gx| / |Gy| d) |Gx| x |Gy|

14) Discontinuity approach of segmentation depends upon
   a) Low frequencies b) Smooth changes
   c) Abrupt changes d) Contrast

_____

SLR-TJ – 176

Seat No.	

B.E. (Electronics Engineering) (New) (CGPA – Part – I) Examination, 2017
Elective – I : IMAGE PROCESSING

Day and Date : Friday, 8-12-2017 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)**

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** : **(2×6=12)**

a) What do you mean by Digital Image Processing ? Discuss the different application areas of digital image processing.

b) Compare the basic frequency domain filters.

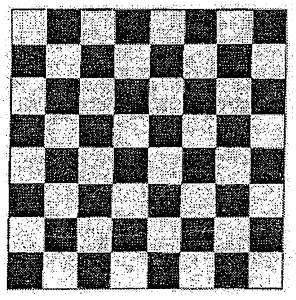
i) Ideal low pass. ii) Butterworth pass.

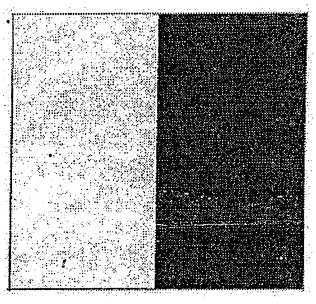
iii) Gaussian low pass.

c) The images shown below have same histograms. Suppose that each image is blurred with a 3 × 3 averaging mask.

a) Would the histogram of blurred images still be equal ? Explain.

b) If your answer is NO, sketch the two histograms.





SECTION – II

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

   a) What is the advantage of sobel operator over prewitt operator ?

   b) Explain region growing.

   c) Write note on signatures.

   d) Explain different compression methods.

   e) Write a note on signatures and skeletons.

5. Attempt **any two** : **(2×6=12)**

   a) Explain following techniques for boundary approximations using polygon :

      a) Minimum perimeter Polygon.

      b) Speitting techniques.

   b) What is global threshold for segmentation ? Give algorithm for obtaining threshold value.

   c) Explain JPEG compression and decompression.

SLR-TJ – 176

Seat No.	

Set S

B.E. (Electronics Engineering) (New) (CGPA – Part – I) Examination, 2017
Elective – I : IMAGE PROCESSING

Day and Date : Friday, 8-12-2017 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 : **14**

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

P.T.O.

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) Collection of pixel
   c) Matrix of pixel
   d) All of these

7) Image enhancement and restoration are used to process
   a) High resolution images
   b) Degraded images
   c) High quality images
   d) Brighter images

8) Gradient computation equation is
   a) |Gx| + |Gy|
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   c) |Gx| / |Gy|
   d) |Gx| x |Gy|

9) Discontinuity approach of segmentation depends upon
   a) Low frequencies
   b) Smooth changes
   c) Abrupt changes
   d) Contrast

10) Two regions are said to be adjacent if their union forms
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   c) boundaries
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11) Example of similarity approach in image segmentation is
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   c) region based segmentation
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12) Process of manipulating the digital image to make results more suitable is called
   a) manipulation
   b) improvement
   c) enhancement
   d) degradation

13) High pass filters are used for image
   a) contrast
   b) sharpening
   c) blurring
   d) resizing

14) Thresholding function in contrast stretching creates
   a) binary image
   b) high quality image
   c) enhanced image
   d) low quality image

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SLR-TJ – 176

Seat No.	

B.E. (Electronics Engineering) (New) (CGPA – Part – I) Examination, 2017
Elective – I : IMAGE PROCESSING

Day and Date : Friday, 8-12-2017 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)**

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** : **(2×6=12)**

a) What do you mean by Digital Image Processing ? Discuss the different application areas of digital image processing.

b) Compare the basic frequency domain filters.

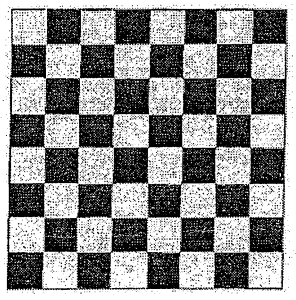
i) Ideal low pass. ii) Butterworth pass.

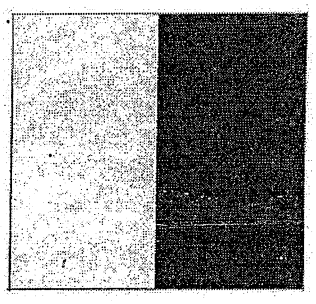
iii) Gaussian low pass.

c) The images shown below have same histograms. Suppose that each image is blurred with a 3 × 3 averaging mask.

a) Would the histogram of blurred images still be equal ? Explain.

b) If your answer is NO, sketch the two histograms.





SECTION – II

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

   a) What is the advantage of sobel operator over prewitt operator ?

   b) Explain region growing.

   c) Write note on signatures.

   d) Explain different compression methods.

   e) Write a note on signatures and skeletons.

5. Attempt **any two** : **(2×6=12)**

   a) Explain following techniques for boundary approximations using polygon :

      a) Minimum perimeter Polygon.

      b) Speitting techniques.

   b) What is global threshold for segmentation ? Give algorithm for obtaining threshold value.

   c) Explain JPEG compression and decompression.

SLR-TJ – 177

Seat No.	

Set **P**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 21-11-2017 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*** *indicates* ***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) Which one of the following is not a negative resistance device ?
a) Gunn diode b) Tunnel diode c) Impatt diode d) Varactor diode

2) Which of the following is wrong for a magic used to tee ?
a) E and H arms are decoupled
b) Coplanar arms are coupled
c) All ports are perfectly matched
d) A signal into coplanar arm splits equally between E and H arms

3) A pulsed radar produces 1 μ sec pulses at a rate of 1000 per second. The duty cycle is
a) 0.001 b) 0.01 c) 0.1 d) 1

4) In a TWT the amplitude of resultant wave travelling down the helix remains constant
a) True b) False

5) 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

6) A waveguide section in a microwave circuit acts as
a) LP filter b) Bandpass filter c) HP filter d) Band stop filter

7) At what position is the input signal inserted into a traveling-wave tube ?
a) At the cathode end of the helix b) At the collector
c) At the collector end of the helix d) At the control grid of the electron gun

8) If the instantaneous RF potentials on the two sides of a magnetron cavity are of opposite polarity, the operation is in the
a) π mode b) $\pi/2$ mode c) 2π mode d) $\pi/4$ mode

9) The Gunn diode oscillator
   a) Is capable of generating continuous microwave power of the order of kilowatt
   b) Generates frequencies which are below 100 MHz
   c) Operates over a positive resistance characteristic
   d) Depends on the formation of charge domain

10) PIN diode has
   a) p^+ and n layers separated by i layer
   b) p^+ and n^+ layers separated by i layer
   c) p^- and n^- layers separated by i layer
   d) none of the above

11) A common up-converter and down-converter IF in satellite communications is
   a) 36 MHz b) 40 MHz c) 70 MHz d) 500 MHz

12) It is the angle between the earth's equatorial plane and the orbital plane of the satellite measured counterclockwise.
   a) Angle of elevation
   b) Angle of azimuth
   c) Angle of inclination
   d) Angle of tetrahedron

13) Which of the following types of HPA is not used in earth stations ?
   a) TWT b) Klystron c) Transistors d) Magnetron

14) When the satellite rotates in an orbit directly above the equator, usually in circular pattern. This type of orbit is called
   a) Polar orbit
   b) Synchronous orbit
   c) Geosynchronous satellite
   d) Equatorial orbit

15) The geographical representation of a satellite antenna's radiation pattern is called a
   a) Field intensity
   b) Footprint
   c) Radiation propagation
   d) Polarization

16) The key electronic component in a communications satellite is the
   a) Telemetry
   b) Command and Control system
   c) On-board computer
   d) Transponder

17) The process of maneuvering a satellite with in a preassigned window is called
   a) Satellite keeping
   b) Station controlling
   c) Station keeping
   d) Satellite controlling

18) How do you describe the complete signal path of the satellite communications operation ?
   a) Begins at a ground station, proceeds to an uplink, then to a downlink, and ends at a receiving ground station
   b) From the satellite, to a downlink, then to a ground station
   c) Begins at a ground station, proceeds to an uplink, to the satellite itself, to a downlink, and ends at a receiving ground station
   d) All of these

19) The core of an optical fiber has a
   a) Lower refracted index than air
   b) Lower refractive index than the cladding
   c) Higher refractive index than the cladding
   d) Similar refractive index with the cladding

20) Is the different angle of entry of light into an optical fiber when the diameter of the core is many times the wavelength of the light transmitted ?
   a) Acceptance angle b) Modes c) Sensors d) Aperture

SLR-TJ – 177

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 21-11-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any three** : **(3×8=24)**

   a) Realize construction and working of TWT (travelling wave tube). State its performance parameters.

   b) Draw block diagram of MTI radar system and explain its working principal.

   c) Realize construction and working of IMPATT diode.

   d) Derive the equation for velocity modulations and bunching processes in klystron.

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

   a) With suitable diagram explain working of Isolator.

   b) State and explain any three limitations of conversation devices over high frequency.

   c) State the Scattering Matrix for E-Plane Tee junction.

   d) Write a note on FM-CW Radar.

   e) Derive radar range equation.

SECTION – II

4. Attempt **any three** : **(3×8=24)**

   a) With suitable block diagrams explain telemetry, tracking and command (TT&C) subsystem of satellite.

   b) Derive the expression for up-link and down link design.

c) Realize construction and working of edge emitting double hertojunction LED.

d) Describe working of DBS-TV receiver.

5. Attempt **any four**. **(4×4=16)**

a) Derive numerical aperture for step index fiber.

b) Compare between TDMA, FDMA and DAMA.

c) Discuss bending losses in optical fiber.

d) Describe single conversion and double conversion transponder system.

e) Show and explain angle of inclination and angle of elevation in satellite with neat diagram.

SLR-TJ – 177

Seat No.	

Set **Q**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 21-11-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

Duration : 30 Minutes Marks : 20

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

1) The key electronic component in a communications satellite is the
   a) Telemetry b) Command and Control system
   c) On-board computer d) Transponder
2) The process of maneuvering a satellite with in a preassigned window is called
   a) Satellite keeping b) Station controlling
   c) Station keeping d) Satellite controlling
3) How do you describe the complete signal path of the satellite communications operation ?
   a) Begins at a ground station, proceeds to an uplink, then to a downlink, and ends at a receiving ground station
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   c) Begins at a ground station, proceeds to an uplink, to the satellite itself, to a downlink, and ends at a receiving ground station
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4) The core of an optical fiber has a
   a) Lower refracted index than air b) Lower refractive index than the cladding
   c) Higher refractive index than the cladding d) Similar refractive index with the cladding
5) Is the different angle of entry of light into an optical fiber when the diameter of the core is many times the wavelength of the light transmitted ?
   a) Acceptance angle b) Modes c) Sensors d) Aperture
6) Which one of the following is not a negative resistance device ?
   a) Gunn diode b) Tunnel diode c) Impatt diode d) Varactor diode
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   b) Coplanar arms are coupled
   c) All ports are perfectly matched
   d) A signal into coplanar arm splits equally between E and H arms

P.T.O.

8) A pulsed radar produces 1 μ sec pulses at a rate of 1000 per second. The duty cycle is
   a) 0.001 b) 0.01 c) 0.1 d) 1

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   a) LP filter b) Bandpass filter c) HP filter d) Band stop filter

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14) The Gunn diode oscillator
   a) Is capable of generating continuous microwave power of the order of kilowatt
   b) Generates frequencies which are below 100 MHz
   c) Operates over a positive resistance characteristic
   d) Depends on the formation of charge domain

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   c) p^- and n^- layers separated by i layer d) none of the above

16) A common up-converter and down-converter IF in satellite communications is
   a) 36 MHz b) 40 MHz c) 70 MHz d) 500 MHz

17) It is the angle between the earth's equatorial plane and the orbital plane of the satellite measured counterclockwise.
   a) Angle of elevation b) Angle of azimuth
   c) Angle of inclination d) Angle of tetrahedron

18) Which of the following types of HPA is not used in earth stations ?
   a) TWT b) Klystron c) Transistors d) Magnetron

19) When the satellite rotates in an orbit directly above the equator, usually in circular pattern. This type of orbit is called
   a) Polar orbit b) Synchronous orbit
   c) Geosynchronous satellite d) Equatorial orbit

20) The geographical representation of a satellite antenna's radiation pattern is called a
   a) Field intensity b) Footprint
   c) Radiation propagation d) Polarization

SLR-TJ – 177

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 21-11-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any three** : **(3×8=24)**

   a) Realize construction and working of TWT (travelling wave tube). State its performance parameters.

   b) Draw block diagram of MTI radar system and explain its working principal.

   c) Realize construction and working of IMPATT diode.

   d) Derive the equation for velocity modulations and bunching processes in klystron.

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

   a) With suitable diagram explain working of Isolator.

   b) State and explain any three limitations of conversation devices over high frequency.

   c) State the Scattering Matrix for E-Plane Tee junction.

   d) Write a note on FM-CW Radar.

   e) Derive radar range equation.

SECTION – II

4. Attempt **any three** : **(3×8=24)**

   a) With suitable block diagrams explain telemetry, tracking and command (TT&C) subsystem of satellite.

   b) Derive the expression for up-link and down link design.

c) Realize construction and working of edge emitting double hertojunction LED.

d) Describe working of DBS-TV receiver.

5. Attempt **any four**. **(4×4=16)**

a) Derive numerical aperture for step index fiber.

b) Compare between TDMA, FDMA and DAMA.

c) Discuss bending losses in optical fiber.

d) Describe single conversion and double conversion transponder system.

e) Show and explain angle of inclination and angle of elevation in satellite with neat diagram.

_____

SLR-TJ – 177

Seat No.	

Set **R**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 21-11-2017 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** indicates **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) A common up-converter and down-converter IF in satellite communications is
a) 36 MHz b) 40 MHz c) 70 MHz d) 500 MHz

2) It is the angle between the earth's equatorial plane and the orbital plane of the satellite measured counterclockwise.
a) Angle of elevation b) Angle of azimuth
c) Angle of inclination d) Angle of tetrahedron

3) Which of the following types of HPA is not used in earth stations ?
a) TWT b) Klystron c) Transistors d) Magnetron

4) When the satellite rotates in an orbit directly above the equator, usually in circular pattern. This type of orbit is called
a) Polar orbit b) Synchronous orbit
c) Geosynchronous satellite d) Equatorial orbit

5) The geographical representation of a satellite antenna's radiation pattern is called a
a) Field intensity b) Footprint
c) Radiation propagation d) Polarization

6) The key electronic component in a communications satellite is the
a) Telemetry b) Command and Control system
c) On-board computer d) Transponder

7) The process of maneuvering a satellite with in a preassigned window is called
a) Satellite keeping b) Station controlling
c) Station keeping d) Satellite controlling

8) How do you describe the complete signal path of the satellite communications operation ?
a) Begins at a ground station, proceeds to an uplink, then to a downlink, and ends at a receiving ground station
b) From the satellite, to a downlink, then to a ground station
c) Begins at a ground station, proceeds to an uplink, to the satellite itself, to a downlink, and ends at a receiving ground station
d) All of these

9) The core of an optical fiber has a
   a) Lower refracted index than air
   b) Lower refractive index than the cladding
   c) Higher refractive index than the cladding
   d) Similar refractive index with the cladding

10) Is the different angle of entry of light into an optical fiber when the diameter of the core is many times the wavelength of the light transmitted ?
   a) Acceptance angle b) Modes c) Sensors d) Aperture

11) Which one of the following is not a negative resistance device ?
   a) Gunn diode b) Tunnel diode c) Impatt diode d) Varactor diode

12) Which of the following is wrong for a magic used to tee ?
   a) E and H arms are decoupled
   b) Coplanar arms are coupled
   c) All ports are perfectly matched
   d) A signal into coplanar arm splits equally between E and H arms

13) A pulsed radar produces 1 μ sec pulses at a rate of 1000 per second. The duty cycle is
   a) 0.001 b) 0.01 c) 0.1 d) 1

14) In a TWT the amplitude of resultant wave travelling down the helix remains constant
   a) True b) False

15) 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

16) A waveguide section in a microwave circuit acts as
   a) LP filter b) Bandpass filter c) HP filter d) Band stop filter

17) At what position is the input signal inserted into a traveling-wave tube ?
   a) At the cathode end of the helix
   b) At the collector
   c) At the collector end of the helix
   d) At the control grid of the electron gun

18) If the instantaneous RF potentials on the two sides of a magnetron cavity are of opposite polarity, the operation is in the
   a) π mode b) $\pi/2$ mode c) 2π mode d) $\pi/4$ mode

19) The Gunn diode oscillator
   a) Is capable of generating continuous microwave power of the order of kilowatt
   b) Generates frequencies which are below 100 MHz
   c) Operates over a positive resistance characteristic
   d) Depends on the formation of charge domain

20) PIN diode has
   a) p^+ and n layers separated by i layer
   b) p^+ and n^+ layers separated by i layer
   c) p^- and n^- layers separated by i layer
   d) none of the above

SLR-TJ – 177

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 21-11-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any three** : **(3×8=24)**

   a) Realize construction and working of TWT (travelling wave tube). State its performance parameters.

   b) Draw block diagram of MTI radar system and explain its working principal.

   c) Realize construction and working of IMPATT diode.

   d) Derive the equation for velocity modulations and bunching processes in klystron.

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

   a) With suitable diagram explain working of Isolator.

   b) State and explain any three limitations of conversation devices over high frequency.

   c) State the Scattering Matrix for E-Plane Tee junction.

   d) Write a note on FM-CW Radar.

   e) Derive radar range equation.

SECTION – II

4. Attempt **any three** : **(3×8=24)**

   a) With suitable block diagrams explain telemetry, tracking and command (TT&C) subsystem of satellite.

   b) Derive the expression for up-link and down link design.

c) Realize construction and working of edge emitting double hertojunction LED.

d) Describe working of DBS-TV receiver.

5. Attempt **any four**. **(4×4=16)**

a) Derive numerical aperture for step index fiber.

b) Compare between TDMA, FDMA and DAMA.

c) Discuss bending losses in optical fiber.

d) Describe single conversion and double conversion transponder system.

e) Show and explain angle of inclination and angle of elevation in satellite with neat diagram.

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SLR-TJ – 177

Seat No.	

Set **S**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 21-11-2017 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*** *indicates* ***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) A waveguide section in a microwave circuit acts as
   a) LP filter b) Bandpass filter c) HP filter d) Band stop filter

2) At what position is the input signal inserted into a traveling-wave tube ?
   a) At the cathode end of the helix b) At the collector
   c) At the collector end of the helix d) At the control grid of the electron gun

3) If the instantaneous RF potentials on the two sides of a magnetron cavity are of opposite polarity, the operation is in the
   a) π mode b) $\pi/2$ mode c) 2π mode d) $\pi/4$ mode

4) The Gunn diode oscillator
   a) Is capable of generating continuous microwave power of the order of kilowatt
   b) Generates frequencies which are below 100 MHz
   c) Operates over a positive resistance characteristic
   d) Depends on the formation of charge domain

5) PIN diode has
   a) p^+ and n layers separated by i layer b) p^+ and n^+ layers separated by i layer
   c) p^- and n^- layers separated by i layer d) none of the above

6) A common up-converter and down-converter IF in satellite communications is
   a) 36 MHz b) 40 MHz c) 70 MHz d) 500 MHz

7) It is the angle between the earth's equatorial plane and the orbital plane of the satellite measured counterclockwise.
   a) Angle of elevation b) Angle of azimuth
   c) Angle of inclination d) Angle of tetrahedron

P.T.O.

8) Which of the following types of HPA is not used in earth stations ?
   a) TWT b) Klystron c) Transistors d) Magnetron

9) When the satellite rotates in an orbit directly above the equator, usually in circular pattern. This type of orbit is called
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   c) Geosynchronous satellite d) Equatorial orbit

10) The geographical representation of a satellite antenna's radiation pattern is called a
   a) Field intensity b) Footprint
   c) Radiation propagation d) Polarization

11) The key electronic component in a communications satellite is the
   a) Telemetry b) Command and Control system
   c) On-board computer d) Transponder

12) The process of maneuvering a satellite with in a preassigned window is called
   a) Satellite keeping b) Station controlling
   c) Station keeping d) Satellite controlling

13) How do you describe the complete signal path of the satellite communications operation ?
   a) Begins at a ground station, proceeds to an uplink, then to a downlink, and ends at a receiving ground station
   b) From the satellite, to a downlink, then to a ground station
   c) Begins at a ground station, proceeds to an uplink, to the satellite itself, to a downlink, and ends at a receiving ground station
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14) The core of an optical fiber has a
   a) Lower refracted index than air b) Lower refractive index than the cladding
   c) Higher refractive index than the cladding d) Similar refractive index with the cladding

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   a) Acceptance angle b) Modes c) Sensors d) Aperture

16) Which one of the following is not a negative resistance device ?
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17) Which of the following is wrong for a magic used to tee ?
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   c) All ports are perfectly matched
   d) A signal into coplanar arm splits equally between E and H arms

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   a) 0.001 b) 0.01 c) 0.1 d) 1

19) In a TWT the amplitude of resultant wave travelling down the helix remains constant
   a) True b) False

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   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

SLR-TJ – 177

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
ADVANCED COMMUNICATION ENGINEERING

Day and Date : Tuesday, 21-11-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

SECTION – I

2. Attempt **any three** : **(3×8=24)**

   a) Realize construction and working of TWT (travelling wave tube). State its performance parameters.

   b) Draw block diagram of MTI radar system and explain its working principal.

   c) Realize construction and working of IMPATT diode.

   d) Derive the equation for velocity modulations and bunching processes in klystron.

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

   a) With suitable diagram explain working of Isolator.

   b) State and explain any three limitations of conversation devices over high frequency.

   c) State the Scattering Matrix for E-Plane Tee junction.

   d) Write a note on FM-CW Radar.

   e) Derive radar range equation.

SECTION – II

4. Attempt **any three** : **(3×8=24)**

   a) With suitable block diagrams explain telemetry, tracking and command (TT&C) subsystem of satellite.

   b) Derive the expression for up-link and down link design.

c) Realize construction and working of edge emitting double hertojunction LED.

d) Describe working of DBS-TV receiver.

5. Attempt **any four**. **(4×4=16)**

a) Derive numerical aperture for step index fiber.

b) Compare between TDMA, FDMA and DAMA.

c) Discuss bending losses in optical fiber.

d) Describe single conversion and double conversion transponder system.

e) Show and explain angle of inclination and angle of elevation in satellite with neat diagram.

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SLR-TJ – 178

Seat No.	

Set P

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEM

Day and Date : Wednesday, 22-11-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer :

1) Paint programs and image editors are used for creating and editing
   a) Text b) Vector images c) Bitmap images d) HTML codes

2) In video compression, an independent frame that is not related to any other frame is called
   a) B-Frame b) C-Frame c) I-Frame d) P-Frame

3) The front porch is kept ahead of the line sync pulse.
   a) To black out the line before the sync initiates the fly-back
   b) To blank out the transient oscillations in the horizontal deflection
   c) To allow the video signal to settle to a constant amplitude before the line sync is initiated
   d) None

4) A compressed audio/video file can be downloaded as a
   a) Image b) Video c) Text file d) Frame

5) Which of the following relation is correct ?
   a) $S = \frac{F}{2G}$ b) $F = \frac{S}{2G}$ c) $F = \frac{G}{2S}$ d) $S = \frac{G}{2F}$

6) 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.

7) Compared to progressive scanning, the interlacing technique reduces bandwidth because
   a) The picture scanning rate is increased
   b) The picture scanning rate is reduced
   c) The effective picture scanning rate is kept same while pixel scanning rate is halved
   d) b) and c) both

8) Yagi-Uda antenna is used in television receiver for signal locations within the range of
   a) 40 to 60 km b) 80 to 100 km c) 120 to 140 km d) 140 to 160 km

9) The principle of image orthicon camera tube is based on the principle of
   a) Photo-emissivity b) Photo-resistivity
   c) Photo-conductivity d) None

10) VSB modulation is preferred for TV transmission because
   a) It is less critical than SSB modulation
   b) It avoids phase distortion problems at low frequencies
   c) It reduces bandwidth required to half
   d) b) and c)

11) The process of bringing beam together in picture tube is known as
   a) Purity b) Convergence c) Degaussing d) Pincushion

12) 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)

13) 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

14) The two new signals generated in PAL system are
   a) (B – Y) and (R – Y) b) R and B
   c) I and Q d) U and V

15) _____ is the spectral purity of colour light.
   a) Luminance b) Brightness c) Hue d) Saturation

16) Automatic Frequency Control (AFC) is required in _____section.
   a) Vertical b) Horizontal c) Both a) and b) d) None

17) The length of tape magnetized by one cycle of audio signal is called
   a) Bar magnet b) Wavelength c) Tape length d) Head gap

18) The type of AGC used in TV receiver is
   a) Simple AGC b) Delayed AGC c) Keyed AGC d) b) and c) both

19) Slotted aperture mask is used in
   a) Trintron b) PIL tubes c) Shadow mask tube d) a) and b)

20) In PAL system, phase of R-Y signal is changed every alternate line by
   a) 90° b) 180° c) 270° d) 360°

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SLR-TJ – 178

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEM

Day and Date : Wednesday, 22-11-2017 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)**

a) Compare 2D and 3D animation techniques.

b) Explain MPEG audio encoder with suitable block diagram.

c) Why is compression essential in multimedia applications ?

d) Define and compare luminance and chrominance signal of TV transmitter.

e) Give the relationship between gap-size, tape speed and frequency of the audio signal. Explain the importance of this equation to get optimum output for audio.

3. Attempt **any three** : **(3×8=24)**

a) Explain the principle and working of magnetic recording and reproduction. Compare disc recording and tape recording systems.

b) With block diagram, explain functions of each block of mono-chrome TV receiver.

c) Explain the working principle of Xerography with suitable block diagram.

d) What is real time video ? How coding of real time video is carried out ?

SECTION – II

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

   a) Compare NTSC and PAL colour television standards.

   b) Describe PIL picture tube with neat diagram.

   c) Show that interlaced scanning reduces flicker and conserves bandwidth.

   d) List out significant features of HDTV over standard TV.

   e) What is AGC ? What are different types of AGC ?

5. Attempt **any three** : **(3×8=24)**

   a) Explain PAL encoder with neat diagram.

   b) Draw block diagram of digital TV and explain its working in detail.

   c) What are the requirements of RF tuner ? Draw block diagram of RF tuner.

   d) Explain in detail, working of vertical and horizontal deflection systems in TV receivers.

SLR-TJ – 178

Seat No.	

Set **Q**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEM

Day and Date : Wednesday, 22-11-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer :

1) Automatic Frequency Control (AFC) is required in _____section.
a) Vertical b) Horizontal c) Both a) and b) d) None

2) The length of tape magnetized by one cycle of audio signal is called
a) Bar magnet b) Wavelength c) Tape length d) Head gap

3) The type of AGC used in TV receiver is
a) Simple AGC b) Delayed AGC c) Keyed AGC d) b) and c) both

4) Slotted aperture mask is used in
a) Trintron b) PIL tubes c) Shadow mask tube d) a) and b)

5) In PAL system, phase of R-Y signal is changed every alternate line by
a) 90° b) 180° c) 270° d) 360°

6) Paint programs and image editors are used for creating and editing
a) Text b) Vector images c) Bitmap images d) HTML codes

7) In video compression, an independent frame that is not related to any other frame is called
a) B-Frame b) C-Frame c) I-Frame d) P-Frame

8) The front porch is kept ahead of the line sync pulse.
a) To black out the line before the sync initiates the fly-back
b) To blank out the transient oscillations in the horizontal deflection
c) To allow the video signal to settle to a constant amplitude before the line sync is initiated
d) None

9) A compressed audio/video file can be downloaded as a
   a) Image b) Video c) Text file d) Frame

10) Which of the following relation is correct ?
   a) $S = \frac{F}{2G}$ b) $F = \frac{S}{2G}$ c) $F = \frac{G}{2S}$ d) $S = \frac{G}{2F}$

11) 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

12) Compared to progressive scanning, the interlacing technique reduces bandwidth because
   a) The picture scanning rate is increased
   b) The picture scanning rate is reduced
   c) The effective picture scanning rate is kept same while pixel scanning rate is halved
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13) Yagi-Uda antenna is used in television receiver for signal locations within the range of
   a) 40 to 60 km b) 80 to 100 km c) 120 to 140 km d) 140 to 160 km

14) The principle of image orthicon camera tube is based on the principle of
   a) Photo-emissivity b) Photo-resistivity
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15) VSB modulation is preferred for TV transmission because
   a) It is less critical than SSB modulation
   b) It avoids phase distortion problems at low frequencies
   c) It reduces bandwidth required to half
   d) b) and c)

16) The process of bringing beam together in picture tube is known as
   a) Purity b) Convergence c) Degaussing d) Pincushion

17) 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)

18) 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

19) The two new signals generated in PAL system are
   a) (B – Y) and (R – Y) b) R and B
   c) I and Q d) U and V

20) _____ is the spectral purity of colour light.
   a) Luminance b) Brightness c) Hue d) Saturation

SLR-TJ – 178

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEM

Day and Date : Wednesday, 22-11-2017 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)**

a) Compare 2D and 3D animation techniques.

b) Explain MPEG audio encoder with suitable block diagram.

c) Why is compression essential in multimedia applications ?

d) Define and compare luminance and chrominance signal of TV transmitter.

e) Give the relationship between gap-size, tape speed and frequency of the audio signal. Explain the importance of this equation to get optimum output for audio.

3. Attempt **any three** : **(3×8=24)**

a) Explain the principle and working of magnetic recording and reproduction. Compare disc recording and tape recording systems.

b) With block diagram, explain functions of each block of mono-chrome TV receiver.

c) Explain the working principle of Xerography with suitable block diagram.

d) What is real time video ? How coding of real time video is carried out ?

SECTION – II

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

   a) Compare NTSC and PAL colour television standards.

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   c) Show that interlaced scanning reduces flicker and conserves bandwidth.

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   e) What is AGC ? What are different types of AGC ?

5. Attempt **any three** : **(3×8=24)**

   a) Explain PAL encoder with neat diagram.

   b) Draw block diagram of digital TV and explain its working in detail.

   c) What are the requirements of RF tuner ? Draw block diagram of RF tuner.

   d) Explain in detail, working of vertical and horizontal deflection systems in TV receivers.

SLR-TJ – 178

Seat No.	

Set **R**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEM

Day and Date : Wednesday, 22-11-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer :

1) The process of bringing beam together in picture tube is known as
a) Purity b) Convergence c) Degaussing d) Pincushion

2) 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)

3) 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

4) The two new signals generated in PAL system are
a) (B – Y) and (R – Y) b) R and B
c) I and Q d) U and V

5) _____ is the spectral purity of colour light.
a) Luminance b) Brightness c) Hue d) Saturation

6) Automatic Frequency Control (AFC) is required in _____section.
a) Vertical b) Horizontal c) Both a) and b) d) None

7) The length of tape magnetized by one cycle of audio signal is called
a) Bar magnet b) Wavelength c) Tape length d) Head gap

8) The type of AGC used in TV receiver is
a) Simple AGC b) Delayed AGC c) Keyed AGC d) b) and c) both

P.T.O.

9) Slotted aperture mask is used in
   a) Trintron b) PIL tubes c) Shadow mask tube d) a) and b)

10) In PAL system, phase of R-Y signal is changed every alternate line by
   a) 90° b) 180° c) 270° d) 360°

11) Paint programs and image editors are used for creating and editing
   a) Text b) Vector images c) Bitmap images d) HTML codes

12) In video compression, an independent frame that is not related to any other frame is called
   a) B-Frame b) C-Frame c) I-Frame d) P-Frame

13) The front porch is kept ahead of the line sync pulse.
   a) To black out the line before the sync initiates the fly-back
   b) To blank out the transient oscillations in the horizontal deflection
   c) To allow the video signal to settle to a constant amplitude before the line sync is initiated
   d) None

14) A compressed audio/video file can be downloaded as a
   a) Image b) Video c) Text file d) Frame

15) Which of the following relation is correct ?
   a) $S = \frac{F}{2G}$ b) $F = \frac{S}{2G}$ c) $F = \frac{G}{2S}$ d) $S = \frac{G}{2F}$

16) 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

17) Compared to progressive scanning, the interlacing technique reduces bandwidth because
   a) The picture scanning rate is increased
   b) The picture scanning rate is reduced
   c) The effective picture scanning rate is kept same while pixel scanning rate is halved
   d) b) and c) both

18) Yagi-Uda antenna is used in television receiver for signal locations within the range of
   a) 40 to 60 km b) 80 to 100 km c) 120 to 140 km d) 140 to 160 km

19) The principle of image orthicon camera tube is based on the principle of
   a) Photo-emissivity b) Photo-resistivity
   c) Photo-conductivity d) None

20) VSB modulation is preferred for TV transmission because
   a) It is less critical than SSB modulation
   b) It avoids phase distortion problems at low frequencies
   c) It reduces bandwidth required to half
   d) b) and c)

———————

SLR-TJ – 178

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEM

Day and Date : Wednesday, 22-11-2017 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)**

a) Compare 2D and 3D animation techniques.

b) Explain MPEG audio encoder with suitable block diagram.

c) Why is compression essential in multimedia applications ?

d) Define and compare luminance and chrominance signal of TV transmitter.

e) Give the relationship between gap-size, tape speed and frequency of the audio signal. Explain the importance of this equation to get optimum output for audio.

3. Attempt **any three** : **(3×8=24)**

a) Explain the principle and working of magnetic recording and reproduction. Compare disc recording and tape recording systems.

b) With block diagram, explain functions of each block of mono-chrome TV receiver.

c) Explain the working principle of Xerography with suitable block diagram.

d) What is real time video ? How coding of real time video is carried out ?

SECTION – II

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

   a) Compare NTSC and PAL colour television standards.

   b) Describe PIL picture tube with neat diagram.

   c) Show that interlaced scanning reduces flicker and conserves bandwidth.

   d) List out significant features of HDTV over standard TV.

   e) What is AGC ? What are different types of AGC ?

5. Attempt **any three** : **(3×8=24)**

   a) Explain PAL encoder with neat diagram.

   b) Draw block diagram of digital TV and explain its working in detail.

   c) What are the requirements of RF tuner ? Draw block diagram of RF tuner.

   d) Explain in detail, working of vertical and horizontal deflection systems in TV receivers.

SLR-TJ – 178

Seat No.	

Set **S**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEM

Day and Date : Wednesday, 22-11-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

1. Choose the correct answer :

1) 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

2) Compared to progressive scanning, the interlacing technique reduces bandwidth because
   a) The picture scanning rate is increased
   b) The picture scanning rate is reduced
   c) The effective picture scanning rate is kept same while pixel scanning rate is halved
   d) b) and c) both

3) Yagi-Uda antenna is used in television receiver for signal locations within the range of
   a) 40 to 60 km b) 80 to 100 km c) 120 to 140 km d) 140 to 160 km

4) The principle of image orthicon camera tube is based on the principle of
   a) Photo-emissivity b) Photo-resistivity
   c) Photo-conductivity d) None

5) VSB modulation is preferred for TV transmission because
   a) It is less critical than SSB modulation
   b) It avoids phase distortion problems at low frequencies
   c) It reduces bandwidth required to half
   d) b) and c)

6) The process of bringing beam together in picture tube is known as
   a) Purity b) Convergence c) Degaussing d) Pincushion

P.T.O.

7) 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)

8) 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

9) The two new signals generated in PAL system are
   a) (B – Y) and (R – Y) b) R and B
   c) I and Q d) U and V

10) _____ is the spectral purity of colour light.
   a) Luminance b) Brightness c) Hue d) Saturation

11) Automatic Frequency Control (AFC) is required in _____section.
   a) Vertical b) Horizontal c) Both a) and b) d) None

12) The length of tape magnetized by one cycle of audio signal is called
   a) Bar magnet b) Wavelength c) Tape length d) Head gap

13) The type of AGC used in TV receiver is
   a) Simple AGC b) Delayed AGC c) Keyed AGC d) b) and c) both

14) Slotted aperture mask is used in
   a) Trintron b) PIL tubes c) Shadow mask tube d) a) and b)

15) In PAL system, phase of R-Y signal is changed every alternate line by
   a) 90° b) 180° c) 270° d) 360°

16) Paint programs and image editors are used for creating and editing
   a) Text b) Vector images c) Bitmap images d) HTML codes

17) In video compression, an independent frame that is not related to any other frame is called
   a) B-Frame b) C-Frame c) I-Frame d) P-Frame

18) The front porch is kept ahead of the line sync pulse.
   a) To black out the line before the sync initiates the fly-back
   b) To blank out the transient oscillations in the horizontal deflection
   c) To allow the video signal to settle to a constant amplitude before the line sync is initiated
   d) None

19) A compressed audio/video file can be downloaded as a
   a) Image b) Video c) Text file d) Frame

20) Which of the following relation is correct ?
   a) $S = \frac{F}{2G}$ b) $F = \frac{S}{2G}$ c) $F = \frac{G}{2S}$ d) $S = \frac{G}{2F}$

_____

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Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
AUDIO VIDEO SYSTEM

Day and Date : Wednesday, 22-11-2017 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)**

a) Compare 2D and 3D animation techniques.

b) Explain MPEG audio encoder with suitable block diagram.

c) Why is compression essential in multimedia applications ?

d) Define and compare luminance and chrominance signal of TV transmitter.

e) Give the relationship between gap-size, tape speed and frequency of the audio signal. Explain the importance of this equation to get optimum output for audio.

3. Attempt **any three** : **(3×8=24)**

a) Explain the principle and working of magnetic recording and reproduction. Compare disc recording and tape recording systems.

b) With block diagram, explain functions of each block of mono-chrome TV receiver.

c) Explain the working principle of Xerography with suitable block diagram.

d) What is real time video ? How coding of real time video is carried out ?

SECTION – II

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

   a) Compare NTSC and PAL colour television standards.

   b) Describe PIL picture tube with neat diagram.

   c) Show that interlaced scanning reduces flicker and conserves bandwidth.

   d) List out significant features of HDTV over standard TV.

   e) What is AGC ? What are different types of AGC ?

5. Attempt **any three** : **(3×8=24)**

   a) Explain PAL encoder with neat diagram.

   b) Draw block diagram of digital TV and explain its working in detail.

   c) What are the requirements of RF tuner ? Draw block diagram of RF tuner.

   d) Explain in detail, working of vertical and horizontal deflection systems in TV receivers.

SLR-TJ – 179

Seat No.	

Set P

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Thursday, 23-11-2017 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 on Page No. **3**. **Each** question carries **one** mark.*

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) A _____ processor has large number of general purpose registers.
a) CICS b) RISC
c) Both a) and b) d) None of the above

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 = 0×02020202 and r1 = 0×00009000. What will be the content of r1 after execution of instruction "LDR r0, [r1], #4" ?
a) 0×00009000 b) 0×02020202
c) 0×00009004 d) 0×00008ffb

4) In ARM _____ exception is having the highest priority.
a) Reset b) Supervisor
c) System d) Interrupt request

5) _____ is the debug hardware built into the processor that allows breakpoints and watch points to be set.
a) JTAG b) Embedded ICE Macro-cell
c) Boundary Scan d) None of the above

6) _____ vector is used when the processor cannot decode an instruction.
a) Undefined b) Abort c) Reset d) Data abort

7) Let r5 = 5 and r7 = 8. What will be the content of r7 after execution of instruction "MOV r7, r5, LSL #2" ?
a) 20 b) 14 c) 5 d) 8

P.T.O.

8) In ARM _____exception is having the lowest priority.
   a) Reset b) Supervisor
   c) System d) Undefined instruction

9) In ARM7TDMI-S D stands for
   a) Debug b) Divider
   c) Difference d) None of the above

10) In LPC2148 _____ pin select register is used to configure port pins P1.1 to P1.31.
   a) PINSEL2 b) PINSEL0 c) IODIR2 d) IOSET0

11) TCB stands for
   a) Task Control Block b) Task Condition Block
   c) Task Communication Block d) None of the above

12) 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

13) I2C master can address _____ other slaves at an instance.
   a) 7 b) 11
   c) 127 d) None of the above

14) In I2C _____ device/s exchange data during one 'conversation'.
   a) Only one b) Only two c) More than two d) All of above

15) Information about a task is maintained in a
   a) Stack b) Translation Look aside Buffer
   c) Task Control Block d) Task Condition Block

16) _____ software allows the system activities to be divided into multiple independent elements called tasks.
   a) Kernel b) Shell c) Processor d) Device Driver

17) Binary, Mutual exclusion, Counting are the types of
   a) Queues b) Pipes c) Semaphores d) Mailboxes

18) The SPI bus can operate with a _____ master device/s and with _____ slave device/s.
   a) single, one b) single, one or more
   c) two, single d) two, two

19) SDA and SCL signal lines are used in _____ communication.
   a) SPI b) CAN c) MODBUS d) I2C

20) MISO, MOSI, CS and SCLK signal lines are used in _____ communication.
   a) SPI b) CAN c) MODBUS d) I2C

_____

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Seat No.	

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Thursday, 23-11-2017 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 ***whenever*** *necessary.*

SECTION – I

2. Solve **any four** : **(6×4=24)**
   a) Define embedded system. Explain its characteristics.
   b) Write an ARM ASM code to find total negative numbers from a series of 16 bit numbers.
   c) Define context, interrupt latency, interrupt response time and interrupt recovery time.
   d) Explain hardware architecture of embedded system.
   e) Explain operating modes of ARM7 core in details.

3. Solve **any two** : **(8×2=16)**
   a) Explain Branch transfer instructions in ARM7.
   b) Draw and explain ARM core data flow model.
   c) Explain hardware and software architecture of embedded system.

SECTION – II

4. Solve **any four** : **(6×4=24)**
   a) Define Task. Explain its states.
   b) Write a short note on Semaphore.
   c) Explain different inter-process communication techniques.
   d) Explain embedded communication using SPI.
   e) Draw and explain interfacing of LCD with ARM LPC2148.

5. Solve **any two** : **(8×2=16)**

   a) Explain procedure for determining PLL setting and list required conditions. Also configure CPU clock for 60 MHz if the 10 MHz external crystal is used as a clock source for LPC2148.

   b) Explain embedded system used in Digital Camera.

   c) What is context switch or task switch ? Explain with neat diagram.

SLR-TJ – 179

Seat No.	

Set Q

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Thursday, 23-11-2017 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 on Page No. **3**. **Each** question carries **one** mark.*

*2) **Answer MCQ/Objective type questions on Page No. 3 only. 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) _____ software allows the system activities to be divided into multiple independent elements called tasks.
a) Kernel b) Shell c) Processor d) Device Driver

2) Binary, Mutual exclusion, Counting are the types of
a) Queues b) Pipes c) Semaphores d) Mailboxes

3) The SPI bus can operate with a _____ master device/s and with _____ slave device/s.
a) single, one b) single, one or more
c) two, single d) two, two

4) SDA and SCL signal lines are used in _____ communication.
a) SPI b) CAN c) MODBUS d) I2C

5) MISO, MOSI, CS and SCLK signal lines are used in _____ communication.
a) SPI b) CAN c) MODBUS d) I2C

6) A _____ processor has large number of general purpose registers.
a) CICS b) RISC
c) Both a) and b) d) None of the above

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 = 0×02020202 and r1 = 0×00009000. What will be the content of r1 after execution of instruction "LDR r0, [r1], #4" ?
a) 0×00009000 b) 0×02020202 c) 0×00009004 d) 0×00008ffb

P.T.O.

9) In ARM _____ exception is having the highest priority.
a) Reset b) Supervisor
c) System d) Interrupt request

10) _____ is the debug hardware built into the processor that allows breakpoints and watch points to be set.
a) JTAG b) Embedded ICE Macro-cell
c) Boundary Scan d) None of the above

11) _____ vector is used when the processor cannot decode an instruction.
a) Undefined b) Abort c) Reset d) Data abort

12) Let r5 = 5 and r7 = 8. What will be the content of r7 after execution of instruction "MOV r7, r5, LSL #2" ?
a) 20 b) 14 c) 5 d) 8

13) In ARM _____exception is having the lowest priority.
a) Reset b) Supervisor
c) System d) Undefined instruction

14) In ARM7TDMI-S D stands for
a) Debug b) Divider
c) Difference d) None of the above

15) In LPC2148 _____ pin select register is used to configure port pins P1.1 to P1.31.
a) PINSEL2 b) PINSEL0 c) IODIR2 d) IOSET0

16) TCB stands for
a) Task Control Block b) Task Condition Block
c) Task Communication Block d) None of the above

17) 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

18) I2C master can address _____ other slaves at an instance.
a) 7 b) 11
c) 127 d) None of the above

19) In I2C _____ device/s exchange data during one 'conversation'.
a) Only one b) Only two c) More than two d) All of above

20) Information about a task is maintained in a
a) Stack b) Translation Look aside Buffer
c) Task Control Block d) Task Condition Block

_____

SLR-TJ – 179

Seat No.	

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Thursday, 23-11-2017 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 ***whenever*** *necessary.*

SECTION – I

2. Solve **any four** : **(6×4=24)**
   a) Define embedded system. Explain its characteristics.
   b) Write an ARM ASM code to find total negative numbers from a series of 16 bit numbers.
   c) Define context, interrupt latency, interrupt response time and interrupt recovery time.
   d) Explain hardware architecture of embedded system.
   e) Explain operating modes of ARM7 core in details.

3. Solve **any two** : **(8×2=16)**
   a) Explain Branch transfer instructions in ARM7.
   b) Draw and explain ARM core data flow model.
   c) Explain hardware and software architecture of embedded system.

SECTION – II

4. Solve **any four** : **(6×4=24)**
   a) Define Task. Explain its states.
   b) Write a short note on Semaphore.
   c) Explain different inter-process communication techniques.
   d) Explain embedded communication using SPI.
   e) Draw and explain interfacing of LCD with ARM LPC2148.

5. Solve **any two** : **(8×2=16)**

   a) Explain procedure for determining PLL setting and list required conditions. Also configure CPU clock for 60 MHz if the 10 MHz external crystal is used as a clock source for LPC2148.

   b) Explain embedded system used in Digital Camera.

   c) What is context switch or task switch ? Explain with neat diagram.

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Seat No.	

Set R

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Thursday, 23-11-2017 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 on Page No. **3**. **Each** question carries **one** mark.*
*2) **Answer MCQ/Objective type questions on Page No. 3 only. 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) TCB stands for
a) Task Control Block b) Task Condition Block
c) Task Communication Block d) None of the above

2) 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

3) I2C master can address _____ other slaves at an instance.
a) 7 b) 11
c) 127 d) None of the above

4) In I2C _____ device/s exchange data during one 'conversation'.
a) Only one b) Only two c) More than two d) All of above

5) Information about a task is maintained in a
a) Stack b) Translation Look aside Buffer
c) Task Control Block d) Task Condition Block

6) _____ software allows the system activities to be divided into multiple independent elements called tasks.
a) Kernel b) Shell c) Processor d) Device Driver

7) Binary, Mutual exclusion, Counting are the types of
a) Queues b) Pipes c) Semaphores d) Mailboxes

P.T.O.

8) The SPI bus can operate with a _____ master device/s and with _____ slave device/s.
   a) single, one
   b) single, one or more
   c) two, single
   d) two, two

9) SDA and SCL signal lines are used in _____ communication.
   a) SPI b) CAN c) MODBUS d) I2C

10) MISO, MOSI, CS and SCLK signal lines are used in _____ communication.
   a) SPI b) CAN c) MODBUS d) I2C

11) A _____ processor has large number of general purpose registers.
   a) CICS
   b) RISC
   c) Both a) and b)
   d) None of the above

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 = 0×02020202 and r1 = 0×00009000. What will be the content of r1 after execution of instruction "LDR r0, [r1], #4" ?
   a) 0×00009000
   b) 0×02020202
   c) 0×00009004
   d) 0×00008ffb

14) In ARM _____ exception is having the highest priority.
   a) Reset
   b) Supervisor
   c) System
   d) Interrupt request

15) _____ is the debug hardware built into the processor that allows breakpoints and watch points to be set.
   a) JTAG
   b) Embedded ICE Macro-cell
   c) Boundary Scan
   d) None of the above

16) _____ vector is used when the processor cannot decode an instruction.
   a) Undefined b) Abort c) Reset d) Data abort

17) Let r5 = 5 and r7 = 8. What will be the content of r7 after execution of instruction "MOV r7, r5, LSL #2" ?
   a) 20 b) 14 c) 5 d) 8

18) In ARM _____exception is having the lowest priority.
   a) Reset
   b) Supervisor
   c) System
   d) Undefined instruction

19) In ARM7TDMI-S D stands for
   a) Debug
   b) Divider
   c) Difference
   d) None of the above

20) In LPC2148 _____ pin select register is used to configure port pins P1.1 to P1.31.
   a) PINSEL2 b) PINSEL0 c) IODIR2 d) IOSET0

_____

SLR-TJ – 179

Seat No.	

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Thursday, 23-11-2017 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 ***whenever*** *necessary.*

SECTION – I

2. Solve **any four** : **(6×4=24)**
   a) Define embedded system. Explain its characteristics.
   b) Write an ARM ASM code to find total negative numbers from a series of 16 bit numbers.
   c) Define context, interrupt latency, interrupt response time and interrupt recovery time.
   d) Explain hardware architecture of embedded system.
   e) Explain operating modes of ARM7 core in details.

3. Solve **any two** : **(8×2=16)**
   a) Explain Branch transfer instructions in ARM7.
   b) Draw and explain ARM core data flow model.
   c) Explain hardware and software architecture of embedded system.

SECTION – II

4. Solve **any four** : **(6×4=24)**
   a) Define Task. Explain its states.
   b) Write a short note on Semaphore.
   c) Explain different inter-process communication techniques.
   d) Explain embedded communication using SPI.
   e) Draw and explain interfacing of LCD with ARM LPC2148.

Set R

5. Solve **any two** : **(8×2=16)**

   a) Explain procedure for determining PLL setting and list required conditions. Also configure CPU clock for 60 MHz if the 10 MHz external crystal is used as a clock source for LPC2148.

   b) Explain embedded system used in Digital Camera.

   c) What is context switch or task switch ? Explain with neat diagram.

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Seat No.	

Set S

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Thursday, 23-11-2017 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 on Page No. **3**. **Each** question carries **one** mark.*
*2) **Answer MCQ/Objective type questions on Page No. 3 only. 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) _____ vector is used when the processor cannot decode an instruction.
a) Undefined b) Abort c) Reset d) Data abort

2) Let r5 = 5 and r7 = 8. What will be the content of r7 after execution of instruction "MOV r7, r5, LSL #2" ?
a) 20 b) 14 c) 5 d) 8

3) In ARM _____exception is having the lowest priority.
a) Reset b) Supervisor
c) System d) Undefined instruction

4) In ARM7TDMI-S D stands for
a) Debug b) Divider
c) Difference d) None of the above

5) In LPC2148 _____ pin select register is used to configure port pins P1.1 to P1.31.
a) PINSEL2 b) PINSEL0 c) IODIR2 d) IOSET0

6) TCB stands for
a) Task Control Block b) Task Condition Block
c) Task Communication Block d) None of the above

7) 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

P.T.O.

8) I2C master can address _____ other slaves at an instance.
   a) 7 b) 11
   c) I27 d) None of the above

9) In I2C _____ device/s exchange data during one 'conversation'.
   a) Only one b) Only two c) More than two d) All of above

10) Information about a task is maintained in a
   a) Stack b) Translation Look aside Buffer
   c) Task Control Block d) Task Condition Block

11) _____ software allows the system activities to be divided into multiple independent elements called tasks.
   a) Kernel b) Shell c) Processor d) Device Driver

12) Binary, Mutual exclusion, Counting are the types of
   a) Queues b) Pipes c) Semaphores d) Mailboxes

13) The SPI bus can operate with a _____ master device/s and with _____ slave device/s.
   a) single, one b) single, one or more
   c) two, single d) two, two

14) SDA and SCL signal lines are used in _____ communication.
   a) SPI b) CAN c) MODBUS d) I2C

15) MISO, MOSI, CS and SCLK signal lines are used in _____ communication.
   a) SPI b) CAN c) MODBUS d) I2C

16) A _____ processor has large number of general purpose registers.
   a) CICS b) RISC
   c) Both a) and b) d) None of the above

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 = 0×02020202 and r1 = 0×00009000. What will be the content of r1 after execution of instruction "LDR r0, [r1], #4" ?
   a) 0×00009000 b) 0×02020202
   c) 0×00009004 d) 0×00008ffb

19) In ARM _____ exception is having the highest priority.
   a) Reset b) Supervisor
   c) System d) Interrupt request

20) _____ is the debug hardware built into the processor that allows breakpoints and watch points to be set.
   a) JTAG b) Embedded ICE Macro-cell
   c) Boundary Scan d) None of the above

_____

SLR-TJ – 179

Seat No.	

B.E. (Electronics) (Part – II) Examination, 2017
EMBEDDED SYSTEM

Day and Date : Thursday, 23-11-2017 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 ***whenever*** *necessary.*

SECTION – I

2. Solve **any four** : **(6×4=24)**
   a) Define embedded system. Explain its characteristics.
   b) Write an ARM ASM code to find total negative numbers from a series of 16 bit numbers.
   c) Define context, interrupt latency, interrupt response time and interrupt recovery time.
   d) Explain hardware architecture of embedded system.
   e) Explain operating modes of ARM7 core in details.

3. Solve **any two** : **(8×2=16)**
   a) Explain Branch transfer instructions in ARM7.
   b) Draw and explain ARM core data flow model.
   c) Explain hardware and software architecture of embedded system.

SECTION – II

4. Solve **any four** : **(6×4=24)**
   a) Define Task. Explain its states.
   b) Write a short note on Semaphore.
   c) Explain different inter-process communication techniques.
   d) Explain embedded communication using SPI.
   e) Draw and explain interfacing of LCD with ARM LPC2148.

5. Solve **any two** : **(8×2=16)**

   a) Explain procedure for determining PLL setting and list required conditions. Also configure CPU clock for 60 MHz if the 10 MHz external crystal is used as a clock source for LPC2148.

   b) Explain embedded system used in Digital Camera.

   c) What is context switch or task switch ? Explain with neat diagram.

_____

SLR-TJ – 180

Seat No.	

Set **P**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Friday, 24-11-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) X.25, it was developed for computer connections used for
   a) Time sharing connection b) Terminal connection
   c) Both a) and b) d) None of these

2) DLCI identifies _____ in frame relay.
   a) Virtual circuit b) Receiver's address
   c) Frame d) Both b) and c)

3) The cell relay protocol corresponds to first _____ layer of OSI.
   a) One b) Two c) Three d) Four

4) In cell relay these logical channels are represented as
   a) Virtual Channels (VCs) b) Virtual Paths (VPs)
   c) Both a) and b) d) None of these

5) ATM is an
   a) International Telecommunication
   b) International Telecommunication-Union
   c) International Telecommunication Union-Telecommunication Standardization Sector (ITU-T)
   d) International Telecommunication Union-Telecommunication

6) The _____ service is suitable for customer who need real time video transmission.
   a) CBR b) VBR c) ABR d) UBR

7) Frame relay indicates network congestion using two flags namely _____ bits in data frames.
   a) Forward Explicit Congestion Notification (FECN)
   b) Backward Explicit Congestion Notification (BECN)
   c) Both a) and b)
   d) None of these

P.T.O.

8) Frame relay operates in _____ layer.
   a) Physical
   b) Data link
   c) Physical and data link layers
   d) Physical, data link and network layers

9) ATM cells coming from a user are guaranteed delivery at the other end with a
   a) High probability
   b) Low delay
   c) Both a) and b)
   d) None of these

10) In B-ISDN, when information is obtained from public centre, the service is _____ service.
   a) Conversational
   b) Messaging
   c) Retrieval
   d) Distributive

11) The ISDN Internet working equipment devices are
   a) Terminal Adapters (TAs)
   b) ISDN Bridges
   c) ISDN Routers
   d) All of these

12) Narrow band ISDN is a digital service where the transport speeds are _____ or less.
   a) 1.533 Mbps
   b) 1.544 Mbps
   c) 1.555 Mbps
   d) 1.552 Mbps

13) Disadvantages of cell relay are
   a) Cell discarding occurs with congestion
   b) High cost
   c) Both a) and b)
   d) None of these

14) The _____ channel can be used for telemetry and alarms.
   a) B
   b) D
   c) C
   d) H

15) Equipment that controls the physical and electrical termination of ISDN at the user's premises is called
   a) NT1
   b) NT2
   c) NT3
   d) NT4

16) In ISDN _____, the network can change or process the content of the data.
   a) Bearer services
   b) Teleservices
   c) Supplementary services
   d) None of the above

17) Which service provide up to thirty independent 64 kbps B channels and a separate 64 kbps D channel to carried the signaling ?
   a) Basic rate access
   b) Primary rate access
   c) Both a) and b)
   d) None of these

18) ISDN connections may be seen as very _____ digital pipe.
   a) High rate of error
   b) Low rate of error
   c) Both a) and b)
   d) None of these

19) 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

20) 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

_____

SLR-TJ – 180

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Friday, 24-11-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

***Instructions**:* *1) Multiple choice question is to be solved first.*
*2) Figures to the **right** indicate **full** marks.*
*3) Assume suitable data if **necessary**.*

SECTION – I

2. Attempt **any four** : **(4×5=20)**

1) Explain datagram and virtual circuit approach in connectionless data transfer and compare them.

2) What is the need of control signals in circuit switching ? What are in channel and common channel signaling ?

3) What are packet assembler and dissembler in case of X.25 ? Discuss in brief internal operations and external services related to X.25.

4) Draw ATM protocol architecture and explain it in brief.

5) In ATM communication, how an ATM call is established ?

3. Attempt **any two** : **(2×10=20)**

1) Differentiate between frame relay and frame switching. Describe LAPF core protocol in detail. How congestion is controlled in frame communication ?

2) Draw and explain X.25 packet formats for data packet, control packet and supervisory packet.

3) What are the different types of ATM cell transfer over ATM networks ? 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) Why ATM switching is necessary ? Draw diagram of generic ATM switch element and discuss it in detail.

   2) How an ATM cell is processed in ATM switch ?

   3) List different channels along with their bandwidth values supported in ISDN. Draw ISDN address structure and explain.

   4) Draw ISDN architecture and describe it.

   5) What are the characteristics and application of MANET ?

5. Attempt **any two** : **(2×10=20)**

   1) Draw SONET system hierarchy and discuss it in detail. Draw STS-1 frame format and explain it in brief.

   2) Discuss various BISDN services in detail.

   3) Draw user network interface for ISDN and explain it in detail.

SLR-TJ – 180

Seat No.	

Set **Q**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Friday, 24-11-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) In ISDN _____, the network can change or process the content of the data.
   a) Bearer services b) Teleservices
   c) Supplementary services d) None of the above

2) Which service provide up to thirty independent 64 kbps B channels and a separate 64 kbps D channel to carried the signaling ?
   a) Basic rate access b) Primary rate access
   c) Both a) and b) d) None of these

3) ISDN connections may be seen as very _____ digital pipe.
   a) High rate of error b) Low rate of error
   c) Both a) and b) d) None of these

4) 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

5) 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

6) X.25, it was developed for computer connections used for
   a) Time sharing connection b) Terminal connection
   c) Both a) and b) d) None of these

7) DLCI identifies _____ in frame relay.
   a) Virtual circuit b) Receiver's address
   c) Frame d) Both b) and c)

P.T.O.

8) The cell relay protocol corresponds to first _____ layer of OSI.
   a) One b) Two c) Three d) Four

9) In cell relay these logical channels are represented as
   a) Virtual Channels (VCs) b) Virtual Paths (VPs)
   c) Both a) and b) d) None of these

10) ATM is an
   a) International Telecommunication
   b) International Telecommunication-Union
   c) International Telecommunication Union-Telecommunication Standardization Sector (ITU-T)
   d) International Telecommunication Union-Telecommunication

11) The _____ service is suitable for customer who need real time video transmission.
   a) CBR b) VBR c) ABR d) UBR

12) Frame relay indicates network congestion using two flags namely _____ bits in data frames.
   a) Forward Explicit Congestion Notification (FECN)
   b) Backward Explicit Congestion Notification (BECN)
   c) Both a) and b)
   d) None of these

13) Frame relay operates in _____ layer.
   a) Physical b) Data link
   c) Physical and data link layers d) Physical, data link and network layers

14) ATM cells coming from a user are guaranteed delivery at the other end with a
   a) High probability b) Low delay
   c) Both a) and b) d) None of these

15) In B-ISDN, when information is obtained from public centre, the service is _____ service.
   a) Conversational b) Messaging
   c) Retrieval d) Distributive

16) The ISDN Internet working equipment devices are
   a) Terminal Adapters (TAs) b) ISDN Bridges
   c) ISDN Routers d) All of these

17) Narrow band ISDN is a digital service where the transport speeds are _____ or less.
   a) 1.533 Mbps b) 1.544 Mbps c) 1.555 Mbps d) 1.552 Mbps

18) Disadvantages of cell relay are
   a) Cell discarding occurs with congestion b) High cost
   c) Both a) and b) d) None of these

19) The _____ channel can be used for telemetry and alarms.
   a) B b) D c) C d) H

20) Equipment that controls the physical and electrical termination of ISDN at the user's premises is called
   a) NT1 b) NT2 c) NT3 d) NT4

_____

SLR-TJ – 180

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Friday, 24-11-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

***Instructions**:* *1) Multiple choice question is to be solved first.*
*2) Figures to the **right** indicate **full** marks.*
*3) Assume suitable data if **necessary**.*

SECTION – I

2. Attempt **any four** : **(4×5=20)**

1) Explain datagram and virtual circuit approach in connectionless data transfer and compare them.

2) What is the need of control signals in circuit switching ? What are in channel and common channel signaling ?

3) What are packet assembler and dissembler in case of X.25 ? Discuss in brief internal operations and external services related to X.25.

4) Draw ATM protocol architecture and explain it in brief.

5) In ATM communication, how an ATM call is established ?

3. Attempt **any two** : **(2×10=20)**

1) Differentiate between frame relay and frame switching. Describe LAPF core protocol in detail. How congestion is controlled in frame communication ?

2) Draw and explain X.25 packet formats for data packet, control packet and supervisory packet.

3) What are the different types of ATM cell transfer over ATM networks ? 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) Why ATM switching is necessary ? Draw diagram of generic ATM switch element and discuss it in detail.

   2) How an ATM cell is processed in ATM switch ?

   3) List different channels along with their bandwidth values supported in ISDN. Draw ISDN address structure and explain.

   4) Draw ISDN architecture and describe it.

   5) What are the characteristics and application of MANET ?

5. Attempt **any two** : **(2×10=20)**

   1) Draw SONET system hierarchy and discuss it in detail. Draw STS-1 frame format and explain it in brief.

   2) Discuss various BISDN services in detail.

   3) Draw user network interface for ISDN and explain it in detail.

SLR-TJ – 180

Seat No.	

Set **R**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Friday, 24-11-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) The ISDN Internet working equipment devices are
   a) Terminal Adapters (TAs) b) ISDN Bridges
   c) ISDN Routers d) All of these

2) Narrow band ISDN is a digital service where the transport speeds are _____ or less.
   a) 1.533 Mbps b) 1.544 Mbps c) 1.555 Mbps d) 1.552 Mbps

3) Disadvantages of cell relay are
   a) Cell discarding occurs with congestion b) High cost
   c) Both a) and b) d) None of these

4) The _____ channel can be used for telemetry and alarms.
   a) B b) D c) C d) H

5) Equipment that controls the physical and electrical termination of ISDN at the user's premises is called
   a) NT1 b) NT2 c) NT3 d) NT4

6) In ISDN _____, the network can change or process the content of the data.
   a) Bearer services b) Teleservices
   c) Supplementary services d) None of the above

7) Which service provide up to thirty independent 64 kbps B channels and a separate 64 kbps D channel to carried the signaling ?
   a) Basic rate access b) Primary rate access
   c) Both a) and b) d) None of these

8) ISDN connections may be seen as very _____ digital pipe.
   a) High rate of error b) Low rate of error
   c) Both a) and b) d) None of these

P.T.O.

9) 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

10) 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

11) X.25, it was developed for computer connections used for
   a) Time sharing connection
   b) Terminal connection
   c) Both a) and b)
   d) None of these

12) DLCI identifies _____ in frame relay.
   a) Virtual circuit
   b) Receiver's address
   c) Frame
   d) Both b) and c)

13) The cell relay protocol corresponds to first _____ layer of OSI.
   a) One b) Two c) Three d) Four

14) In cell relay these logical channels are represented as
   a) Virtual Channels (VCs)
   b) Virtual Paths (VPs)
   c) Both a) and b)
   d) None of these

15) ATM is an
   a) International Telecommunication
   b) International Telecommunication-Union
   c) International Telecommunication Union-Telecommunication Standardization Sector (ITU-T)
   d) International Telecommunication Union-Telecommunication

16) The _____ service is suitable for customer who need real time video transmission.
   a) CBR b) VBR c) ABR d) UBR

17) Frame relay indicates network congestion using two flags namely _____ bits in data frames.
   a) Forward Explicit Congestion Notification (FECN)
   b) Backward Explicit Congestion Notification (BECN)
   c) Both a) and b)
   d) None of these

18) Frame relay operates in _____ layer.
   a) Physical
   b) Data link
   c) Physical and data link layers
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19) ATM cells coming from a user are guaranteed delivery at the other end with a
   a) High probability
   b) Low delay
   c) Both a) and b)
   d) None of these

20) In B-ISDN, when information is obtained from public centre, the service is _____ service.
   a) Conversational
   b) Messaging
   c) Retrieval
   d) Distributive

_____

SLR-TJ – 180

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Friday, 24-11-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

***Instructions**:* *1) Multiple choice question is to be solved first.*
*2) Figures to the **right** indicate **full** marks.*
*3) Assume suitable data if **necessary**.*

SECTION – I

2. Attempt **any four** : **(4×5=20)**

1) Explain datagram and virtual circuit approach in connectionless data transfer and compare them.

2) What is the need of control signals in circuit switching ? What are in channel and common channel signaling ?

3) What are packet assembler and dissembler in case of X.25 ? Discuss in brief internal operations and external services related to X.25.

4) Draw ATM protocol architecture and explain it in brief.

5) In ATM communication, how an ATM call is established ?

3. Attempt **any two** : **(2×10=20)**

1) Differentiate between frame relay and frame switching. Describe LAPF core protocol in detail. How congestion is controlled in frame communication ?

2) Draw and explain X.25 packet formats for data packet, control packet and supervisory packet.

3) What are the different types of ATM cell transfer over ATM networks ? 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) Why ATM switching is necessary ? Draw diagram of generic ATM switch element and discuss it in detail.

   2) How an ATM cell is processed in ATM switch ?

   3) List different channels along with their bandwidth values supported in ISDN. Draw ISDN address structure and explain.

   4) Draw ISDN architecture and describe it.

   5) What are the characteristics and application of MANET ?

5. Attempt **any two** : **(2×10=20)**

   1) Draw SONET system hierarchy and discuss it in detail. Draw STS-1 frame format and explain it in brief.

   2) Discuss various BISDN services in detail.

   3) Draw user network interface for ISDN and explain it in detail.

SLR-TJ – 180

Seat No.	

Set **S**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Friday, 24-11-2017 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

MCQ/Objective Type Questions

Duration : 30 Minutes Marks : 20

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

1) The _____ service is suitable for customer who need real time video transmission.
a) CBR b) VBR c) ABR d) UBR

2) Frame relay indicates network congestion using two flags namely _____ bits in data frames.
a) Forward Explicit Congestion Notification (FECN)
b) Backward Explicit Congestion Notification (BECN)
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d) None of these

3) Frame relay operates in _____ layer.
a) Physical b) Data link
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4) ATM cells coming from a user are guaranteed delivery at the other end with a
a) High probability b) Low delay
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5) In B-ISDN, when information is obtained from public centre, the service is _____ service.
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6) The ISDN Internet working equipment devices are
a) Terminal Adapters (TAs) b) ISDN Bridges
c) ISDN Routers d) All of these

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a) 1.533 Mbps b) 1.544 Mbps c) 1.555 Mbps d) 1.552 Mbps

8) Disadvantages of cell relay are
a) Cell discarding occurs with congestion b) High cost
c) Both a) and b) d) None of these

P.T.O.

9) The _____ channel can be used for telemetry and alarms.
   a) B b) D c) C d) H

10) Equipment that controls the physical and electrical termination of ISDN at the user's premises is called
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   c) Supplementary services d) None of the above

12) Which service provide up to thirty independent 64 kbps B channels and a separate 64 kbps D channel to carried the signaling ?
   a) Basic rate access b) Primary rate access
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13) ISDN connections may be seen as very _____ digital pipe.
   a) High rate of error b) Low rate of error
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14) 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

15) 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

16) X.25, it was developed for computer connections used for
   a) Time sharing connection b) Terminal connection
   c) Both a) and b) d) None of these

17) DLCI identifies _____ in frame relay.
   a) Virtual circuit b) Receiver's address
   c) Frame d) Both b) and c)

18) The cell relay protocol corresponds to first _____ layer of OSI.
   a) One b) Two c) Three d) Four

19) In cell relay these logical channels are represented as
   a) Virtual Channels (VCs) b) Virtual Paths (VPs)
   c) Both a) and b) d) None of these

20) ATM is an
   a) International Telecommunication
   b) International Telecommunication-Union
   c) International Telecommunication Union-Telecommunication Standardization Sector (ITU-T)
   d) International Telecommunication Union-Telecommunication

_____

SLR-TJ – 180

Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
BROADBAND COMMUNICATION (Elective – II)

Day and Date : Friday, 24-11-2017 Marks : 80
Time : 3.00 p.m. to 6.00 p.m.

***Instructions**:* *1) Multiple choice question is to be solved first.*
*2) Figures to the **right** indicate **full** marks.*
*3) Assume suitable data if **necessary**.*

SECTION – I

2. Attempt **any four** : **(4×5=20)**

1) Explain datagram and virtual circuit approach in connectionless data transfer and compare them.

2) What is the need of control signals in circuit switching ? What are in channel and common channel signaling ?

3) What are packet assembler and dissembler in case of X.25 ? Discuss in brief internal operations and external services related to X.25.

4) Draw ATM protocol architecture and explain it in brief.

5) In ATM communication, how an ATM call is established ?

3. Attempt **any two** : **(2×10=20)**

1) Differentiate between frame relay and frame switching. Describe LAPF core protocol in detail. How congestion is controlled in frame communication ?

2) Draw and explain X.25 packet formats for data packet, control packet and supervisory packet.

3) What are the different types of ATM cell transfer over ATM networks ? 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) Why ATM switching is necessary ? Draw diagram of generic ATM switch element and discuss it in detail.

   2) How an ATM cell is processed in ATM switch ?

   3) List different channels along with their bandwidth values supported in ISDN. Draw ISDN address structure and explain.

   4) Draw ISDN architecture and describe it.

   5) What are the characteristics and application of MANET ?

5. Attempt **any two** : **(2×10=20)**

   1) Draw SONET system hierarchy and discuss it in detail. Draw STS-1 frame format and explain it in brief.

   2) Discuss various BISDN services in detail.

   3) Draw user network interface for ISDN and explain it in detail.

SLR-TJ – 182

Seat No.	

Set **P**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Friday, 24-11-2017 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

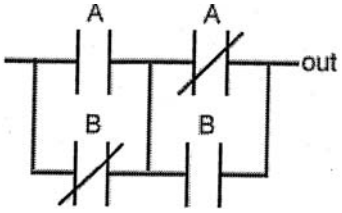
1. Choose the correct answer : **(20×1=20)**

1) Word address in PLC not includes
a) SMPS b) INPUT c) OUTPUT d) Rank Number

2) _____ provides maximum isolation.
a) Pulse transformer b) Normal transformer
c) Opto-isolators d) None of the above

3) Which sensor is self generating type sensor ?
a) Strain gauge b) Thermocouples
c) LVDT d) LM35

4) The output of the ladder diagram is for _____ gate.



a) EXOR b) NOR c) EXNOR d) NAND

5) Scan time in PLC depends upon
a) SMPS b) Linear power supply
c) Number of rows in a ladder d) None of the above

6) PLC is universal controller
a) Yes b) No c) Both d) None of the above

7) In PID controller _____ parameter is responsible for oscillation.
a) KP b) PO c) KD d) KI

8) The basic element of ON/OFF controller is
a) Amplifier b) Comparator
c) Oscillator d) Differential amplifier

P.T.O.

9) Actuators are interfaced with PLC using _____ card.
a) Input b) Output c) Memory d) Power supply

10) Execution time in PLC depends upon
a) Memory size b) Ladder size c) Power supply d) Number of I/O

11) The number I/O for a micro PLC are
a) More than 8 b) Less than 4 c) More than 16 d) More than 32

12) The term PLC stands for
a) Personal Logic Computer b) Programmable Logic Computer
c) Personal Logic Controller d) Programmable Logic Controller

13) The term FBD regarding PLC programming stands for
a) Function Block Diagram b) Functional Building Diagram
c) Functional Block Diagram d) None of the above

14) The PLC contact shown in Figure is

a) a normally open contact b) an output
c) a normally closed contact d) a timer

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) The term reset control refers to
a) Proportional b) Integral c) Derivative d) None of the above

17) The integral control
a) Increases the steady state error b) Decreases the steady state error
c) Increases the noise and stability d) Decreases the damping coefficient

18) 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

19) A counter that starts from a specified number and decrements down to zero is known as the
a) Up counter b) Down counter
c) Universal counter d) Cascading counter

20) ____ is a PLC function capable of storing and shifting binary data.
a) Timer b) Counter c) Shift register d) Relay

_____

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Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Friday, 24-11-2017 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 ***wherever*** *necessary.*

SECTION – I

2. Attempt **any four** : **(5×4=20)**

a) Why SMPS is preferred over linear power supply in case of PLC ?

b) What is SCAN in PLC ?

c) Write note on classification of PLC's.

d) Explain input and output addresses in PLC.

e) Draw the block diagram of PLC and explain each block.

3. Attempt **any two** : **(10×2=20)**

a) Develop a ladder diagram to start and stop the motor using 'START' and 'STOP' push buttons. Represent the solution as per

i) Physical ladder

ii) Programmable ladder.

b) Develop a ladder diagram for preparing ice in a factory.

Narrative statement :

i) Fill the tank with water.

ii) Start the compressor.

iii) Ensure that the ice has been ready or not.

iv) Wait for 1 minute

v) Open the door.

c) Explain with suitable example how the PLC's are selected for specific applications.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   a) What are the different components of robotic system ? How these components are interfaced ?
   b) Compare grounded load converter and floating load converter.
   c) Write short note on control valve.
   d) Describe converter for conversion of 0v to 5v into 4 mA to 20 mA using floating load.

5. Attempt **any two** : **(10×2=20)**
   a) Derive a mathematical model for proportional controller. Explain electronic proportional (P) controller with necessary circuit diagrams.
   b) Explain Data Acquisition System (DAS) in detail.
   c) Explain different types of float sensors with neat diagrams.

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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 : Friday, 24-11-2017 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 term reset control refers to
a) Proportional b) Integral c) Derivative d) None of the above

2) The integral control
a) Increases the steady state error b) Decreases the steady state error
c) Increases the noise and stability d) Decreases the damping coefficient

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) A counter that starts from a specified number and decrements down to zero is known as the
a) Up counter b) Down counter
c) Universal counter d) Cascading counter

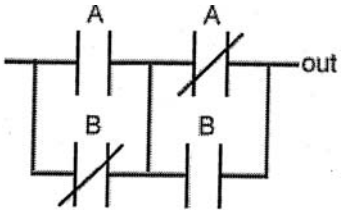
5) ____ is a PLC function capable of storing and shifting binary data.
a) Timer b) Counter c) Shift register d) Relay

6) Word address in PLC not includes
a) SMPS b) INPUT c) OUTPUT d) Rank Number

7) _____ provides maximum isolation.
a) Pulse transformer b) Normal transformer
c) Opto-isolators d) None of the above

8) Which sensor is self generating type sensor ?
a) Strain gauge b) Thermocouples
c) LVDT d) LM35

9) The output of the ladder diagram is for _____ gate.



a) EXOR b) NOR c) EXNOR d) NAND

10) Scan time in PLC depends upon
a) SMPS b) Linear power supply
c) Number of rows in a ladder d) None of the above

11) PLC is universal controller
a) Yes b) No c) Both d) None of the above

12) In PID controller _____ parameter is responsible for oscillation.
a) KP b) PO c) KD d) KI

13) The basic element of ON/OFF controller is
a) Amplifier b) Comparator
c) Oscillator d) Differential amplifier

14) Actuators are interfaced with PLC using _____ card.
a) Input b) Output c) Memory d) Power supply

15) Execution time in PLC depends upon
a) Memory size b) Ladder size c) Power supply d) Number of I/O

16) The number I/O for a micro PLC are
a) More than 8 b) Less than 4 c) More than 16 d) More than 32

17) The term PLC stands for
a) Personal Logic Computer b) Programmable Logic Computer
c) Personal Logic Controller d) Programmable Logic Controller

18) The term FBD regarding PLC programming stands for
a) Function Block Diagram b) Functional Building Diagram
c) Functional Block Diagram d) None of the above

19) The PLC contact shown in Figure is

a) a normally open contact b) an output
c) a normally closed contact d) a timer

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

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Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Friday, 24-11-2017 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 ***wherever*** *necessary.*

SECTION – I

2. Attempt **any four** : **(5×4=20)**

a) Why SMPS is preferred over linear power supply in case of PLC ?

b) What is SCAN in PLC ?

c) Write note on classification of PLC's.

d) Explain input and output addresses in PLC.

e) Draw the block diagram of PLC and explain each block.

3. Attempt **any two** : **(10×2=20)**

a) Develop a ladder diagram to start and stop the motor using 'START' and 'STOP' push buttons. Represent the solution as per

i) Physical ladder

ii) Programmable ladder.

b) Develop a ladder diagram for preparing ice in a factory.

Narrative statement :

i) Fill the tank with water.

ii) Start the compressor.

iii) Ensure that the ice has been ready or not.

iv) Wait for 1 minute

v) Open the door.

c) Explain with suitable example how the PLC's are selected for specific applications.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   a) What are the different components of robotic system ? How these components are interfaced ?
   b) Compare grounded load converter and floating load converter.
   c) Write short note on control valve.
   d) Describe converter for conversion of 0v to 5v into 4 mA to 20 mA using floating load.

5. Attempt **any two** : **(10×2=20)**
   a) Derive a mathematical model for proportional controller. Explain electronic proportional (P) controller with necessary circuit diagrams.
   b) Explain Data Acquisition System (DAS) in detail.
   c) Explain different types of float sensors with neat diagrams.

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SLR-TJ – 182

Seat No.	

Set **R**

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Friday, 24-11-2017 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 number I/O for a micro PLC are
a) More than 8 b) Less than 4 c) More than 16 d) More than 32

2) The term PLC stands for
a) Personal Logic Computer b) Programmable Logic Computer
c) Personal Logic Controller d) Programmable Logic Controller

3) The term FBD regarding PLC programming stands for
a) Function Block Diagram b) Functional Building Diagram
c) Functional Block Diagram d) None of the above

4) The PLC contact shown in Figure is

a) a normally open contact b) an output
c) a normally closed contact d) a timer

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) The term reset control refers to
a) Proportional b) Integral c) Derivative d) None of the above

7) The integral control
a) Increases the steady state error b) Decreases the steady state error
c) Increases the noise and stability d) Decreases the damping coefficient

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) A counter that starts from a specified number and decrements down to zero is known as the
   a) Up counter
   b) Down counter
   c) Universal counter
   d) Cascading counter

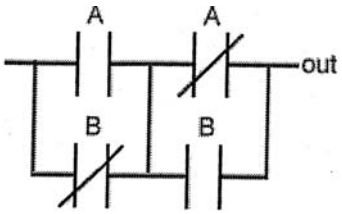
10) ____ is a PLC function capable of storing and shifting binary data.
   a) Timer b) Counter c) Shift register d) Relay

11) Word address in PLC not includes
   a) SMPS b) INPUT c) OUTPUT d) Rank Number

12) _____ provides maximum isolation.
   a) Pulse transformer
   b) Normal transformer
   c) Opto-isolators
   d) None of the above

13) Which sensor is self generating type sensor ?
   a) Strain gauge
   b) Thermocouples
   c) LVDT
   d) LM35

14) The output of the ladder diagram is for _____ gate.



   a) EXOR b) NOR c) EXNOR d) NAND

15) Scan time in PLC depends upon
   a) SMPS
   b) Linear power supply
   c) Number of rows in a ladder
   d) None of the above

16) PLC is universal controller
   a) Yes b) No c) Both d) None of the above

17) In PID controller _____ parameter is responsible for oscillation.
   a) KP b) PO c) KD d) KI

18) The basic element of ON/OFF controller is
   a) Amplifier
   b) Comparator
   c) Oscillator
   d) Differential amplifier

19) Actuators are interfaced with PLC using _____ card.
   a) Input b) Output c) Memory d) Power supply

20) Execution time in PLC depends upon
   a) Memory size b) Ladder size c) Power supply d) Number of I/O

_____

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Seat No.	

B.E. (Electronics Engineering) (Part – II) Examination, 2017
PLC AND INDUSTRIAL CONTROLLERS (Elective – II)

Day and Date : Friday, 24-11-2017 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 ***wherever*** *necessary.*

SECTION – I

2. Attempt **any four** : **(5×4=20)**

a) Why SMPS is preferred over linear power supply in case of PLC ?

b) What is SCAN in PLC ?

c) Write note on classification of PLC's.

d) Explain input and output addresses in PLC.

e) Draw the block diagram of PLC and explain each block.

3. Attempt **any two** : **(10×2=20)**

a) Develop a ladder diagram to start and stop the motor using 'START' and 'STOP' push buttons. Represent the solution as per

i) Physical ladder

ii) Programmable ladder.

b) Develop a ladder diagram for preparing ice in a factory.

Narrative statement :

i) Fill the tank with water.

ii) Start the compressor.

iii) Ensure that the ice has been ready or not.

iv) Wait for 1 minute

v) Open the door.

c) Explain with suitable example how the PLC's are selected for specific applications.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   a) What are the different components of robotic system ? How these components are interfaced ?
   b) Compare grounded load converter and floating load converter.
   c) Write short note on control valve.
   d) Describe converter for conversion of 0v to 5v into 4 mA to 20 mA using floating load.

5. Attempt **any two** : **(10×2=20)**
   a) Derive a mathematical model for proportional controller. Explain electronic proportional (P) controller with necessary circuit diagrams.
   b) Explain Data Acquisition System (DAS) in detail.
   c) Explain different types of float sensors with neat diagrams.

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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 : Friday, 24-11-2017 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) PLC is universal controller
a) Yes b) No c) Both d) None of the above

2) In PID controller _____ parameter is responsible for oscillation.
a) KP b) PO c) KD d) KI

3) The basic element of ON/OFF controller is
a) Amplifier b) Comparator
c) Oscillator d) Differential amplifier

4) Actuators are interfaced with PLC using _____ card.
a) Input b) Output c) Memory d) Power supply

5) Execution time in PLC depends upon
a) Memory size b) Ladder size c) Power supply d) Number of I/O

6) The number I/O for a micro PLC are
a) More than 8 b) Less than 4 c) More than 16 d) More than 32

7) The term PLC stands for
a) Personal Logic Computer b) Programmable Logic Computer
c) Personal Logic Controller d) Programmable Logic Controller

8) The term FBD regarding PLC programming stands for
a) Function Block Diagram b) Functional Building Diagram
c) Functional Block Diagram d) None of the above

9) The PLC contact shown in Figure is

a) a normally open contact b) an output
c) a normally closed contact d) a timer

P.T.O.

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) The term reset control refers to
   a) Proportional b) Integral c) Derivative d) None of the above

12) The integral control
   a) Increases the steady state error b) Decreases the steady state error
   c) Increases the noise and stability d) Decreases the damping coefficient

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) A counter that starts from a specified number and decrements down to zero is known as the
   a) Up counter b) Down counter
   c) Universal counter d) Cascading counter

15) ____ is a PLC function capable of storing and shifting binary data.
   a) Timer b) Counter c) Shift register d) Relay

16) Word address in PLC not includes
   a) SMPS b) INPUT c) OUTPUT d) Rank Number

17) _____ provides maximum isolation.
   a) Pulse transformer b) Normal transformer
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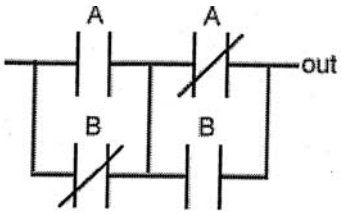
18) Which sensor is self generating type sensor ?
   a) Strain gauge b) Thermocouples
   c) LVDT d) LM35

19) The output of the ladder diagram is for _____ gate.



   a) EXOR b) NOR c) EXNOR d) NAND

20) Scan time in PLC depends upon
   a) SMPS b) Linear power supply
   c) Number of rows in a ladder 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 : Friday, 24-11-2017 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 ***wherever*** *necessary.*

SECTION – I

2. Attempt **any four** : **(5×4=20)**

a) Why SMPS is preferred over linear power supply in case of PLC ?

b) What is SCAN in PLC ?

c) Write note on classification of PLC's.

d) Explain input and output addresses in PLC.

e) Draw the block diagram of PLC and explain each block.

3. Attempt **any two** : **(10×2=20)**

a) Develop a ladder diagram to start and stop the motor using 'START' and 'STOP' push buttons. Represent the solution as per

i) Physical ladder

ii) Programmable ladder.

b) Develop a ladder diagram for preparing ice in a factory.

Narrative statement :

i) Fill the tank with water.

ii) Start the compressor.

iii) Ensure that the ice has been ready or not.

iv) Wait for 1 minute

v) Open the door.

c) Explain with suitable example how the PLC's are selected for specific applications.

SECTION – II

4. Attempt **any four** : **(5×4=20)**
   a) What are the different components of robotic system ? How these components are interfaced ?
   b) Compare grounded load converter and floating load converter.
   c) Write short note on control valve.
   d) Describe converter for conversion of 0v to 5v into 4 mA to 20 mA using floating load.

5. Attempt **any two** : **(10×2=20)**
   a) Derive a mathematical model for proportional controller. Explain electronic proportional (P) controller with necessary circuit diagrams.
   b) Explain Data Acquisition System (DAS) in detail.
   c) Explain different types of float sensors with neat diagrams.

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